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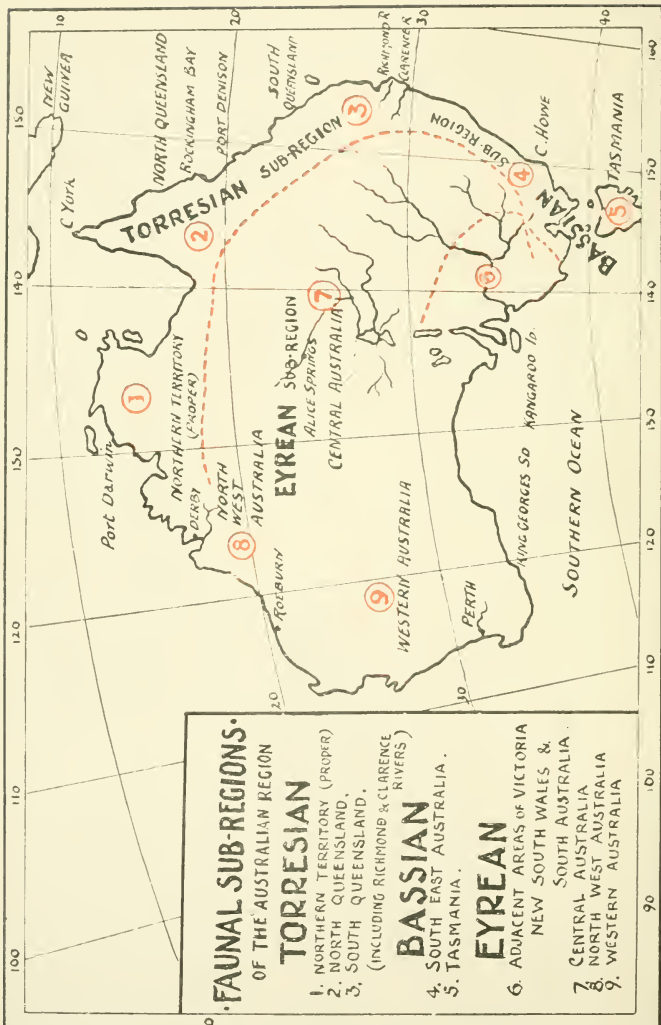
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THE
USEFUL BIRDS OF SOUTHERN AUSTRALIA.



FAUNAL SUB-REGIONS.

OF THE AUSTRALIAN REGION

TORRESIAN

- 1. NORTHERN TERRITORY (PROPER)
- 2. NORTH QUEENSLAND.
- 3. SOUTH QUEENSLAND.

(INCLUDING RICHMOND & CLARENCE RIVERS)

BASSIAN

- 4. SOUTH EAST AUSTRALIA.
- 5. TASMANIA.

EYREAN

- 6. ADJACENT AREAS OF VICTORIA
NEW SOUTH WALES &
SOUTH AUSTRALIA.
- 7. CENTRAL AUSTRALIA
- 8. NORTH WEST AUSTRALIA
- 9. WESTERN AUSTRALIA

THE USEFUL BIRDS

OF

SOUTHERN AUSTRALIA

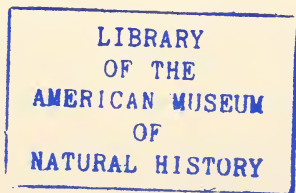
WITH NOTES ON OTHER BIRDS

BY

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JOINT AUTHOR OF "NATURE STUDIES IN AUSTRALIA"



T. C. LOTHIAN
MELBOURNE AND SYDNEY

1907

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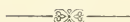
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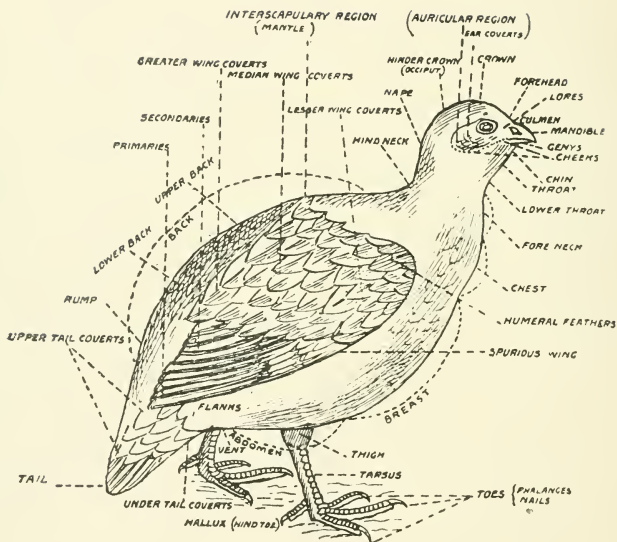


Figure of a Bird, showing the principal external characters.

PREFACE.

OBSERVATION shows the southern half of our continent to contain the majority of birds as common to the whole of it. Further, that they are particularly strong in New South Wales with one wave of expansion westward through South Australia into Western Australia, and a second through Victoria into Tasmania. Thus I am tempted to bring together the useful birds of the southern part of the continent—those species south of a line drawn from Brisbane on the east to Shark's Bay on the west, excepting the subtropical area immediately south of Brisbane.

The scheme of distribution is still based upon that laid down by Professor Baldwin Spencer, C.M.G., F.R.S., who, in the initial stage, thoughtfully suggested to me the possibility of birds being distributed along the lines laid down for mammals. Valuable help in this direction is periodically rendered by *The Emu*, the journal of the Australasian Ornithologists' Union. To all lovers of nature I commend the careful reading of this work.

The derivations and accents are based upon the contribution of Professor T. G. Tucker, Litt. D., to the "Key to the Birds of Australia." I lay much value upon this portion of the work, following, as it does, the finding and the placing of a species.

Taken together the following pages may aid the work of the Directors of Education in a part of the ground work on Nature Study being laid down by them. And this in particular by Mr. Frank Tate, M.A., I.S.O., through whose vigorous and whole-souled feeling the bud of Nature Study is opening out so thoroughly well, not only in his own, but in all the sister States.

May it continue so to do ; for the broader our interests, the simpler and stronger our lives.

R. H.

January, 1907.



INTRODUCTION.

BIRDS play a large part in the economy of nature. In relation to agriculture, fruit-growing, and forestry they are visible agents for good or for ill. The European Starling, lately introduced within our shores—and evidently here to stay—is undoubtedly a foe to the orchardist. On the other hand, until it increases beyond a certain limit, and seeks to change its food, it will remain a good ally of the grazier and agriculturist. The introduced fox is killing thousands of birds which feed largely upon ground vermin, while it appears to me the Starling is taking their place in the balance of nature. Still it is a problem for the future to decide whether a war of suppression shall be waged against the Starling, and it behoves all who have the farming interests at heart to closely watch its ways. Remember the rabbit and the Sparrow!

The Ibis of our swamps and river-systems, and the little Blue Wren of the forest, are well equipped by nature to act in the capacity of feathered police for the protection of man's fields and fruit trees.

A few years ago a large colony of Ibises, totalling perhaps 200,000 individuals, existed on a swamp in New South Wales. These birds were voracious eaters, and it has been calculated

that this single colony accounted for 480 millions of grass-hoppers daily.

The Wren shows a distinct partiality for that destructive pest, the chafer beetle, of which each bird eats at least eighty per day, during the time that the beetle is in greatest number.

It is not generally known that many Honey-eaters play the *rôle* of useful birds: the Wattle-bird, particularly, wages continual war against the Cicada pest.

The services rendered by birds from a health point of view are worthy of notice, albeit such services are indirect. Owls render willing service to the city dweller as well as to the countryman. The Brown Owl of the town environs, in close touch with plague-infested rats, earns our gratitude equally with the White Owls who guard our granaries. Even the much-persecuted Hawk, though he may steal a chicken or two occasionally, demands a measure of protection, for his services are many.

Further, let us enter for one day into some

“Sweetly rural and savage scene,” *

and watch the birds. The ground birds of various species, so intently engaged in searching the surface of the earth, are devouring wire-worms in myriads, and the Quail, which flutters up at our approach, varies its wire-worm diet by devouring vast quantities of seeds, which, if allowed to scatter unchecked, would shortly cover the ground with noxious weeds. The Magpie-Lark wanders over the margin of ponds, creeks, and swamps in search of the host of the sheep-fluke. Warblers incessantly patrol the underwood in search of

insects, whilst the Tree-creepers, ever and anon uttering their shrill cries, scrutinize carefully the trunks and boughs of trees for grubs and other provender.

Wherever we may turn we see the birds industriously searching for their food. Shrike-Tits hunt along the tops of trees, above the Tree-creepers, catching an insect here and another there. Above them again the Swifts are darting like arrows hither and thither, snatching away the insects of the upper air.

Thus from the ground—and even beneath it, for many ground birds dig below the surface for their prey—to the highest regions where insect pests are likely to be found, birds are constantly employed in maintaining a balance, the importance of which can only be realized during the prevalence of a plague. It is a curious fact that among birds there appears to be an allotment of areas beyond the bounds of which individuals dare not venture, except under penalty of severe punishment. Even the pugnacious Magpie dare not go beyond his nesting and feeding block without considerable misgivings. An exception must be made of the Gipsy Cuckoos. They are always in trouble, these parasites. Acre after acre of country they wander over, upsetting hundreds of family arrangements. Every bird's "hand" is against them.

The Fantail, the Wood-Swallow, the Wren, and the Robin are specially concerned in ejecting the Cuckoo from their areas, for the bird loves to lay her eggs in their nests. It is only by a sly evasion of their watchfulness that she is at last able to deposit her egg in the nest of the least watchful bird. But despite the trouble they cause in birdland, Cuckoos are deserving of complete protection, in particular at the hands of the vigneron, whose chosen friends they should be.

With such facts as these before us (and they could be multiplied indefinitely), it is clear that the attention of all interested in the land should be directed to a close study of the particular birds of their districts in order that a just estimate of their services or ravages may be arrived at. Many innocent and useful birds are yearly slaughtered through ignorance of their value, and if this indiscriminate killing continues unchecked it cannot fail to prove disastrous to the landholder, and eventually to the community at large.

The feeling of man towards birds should, on the whole, be a kindly one. The great mass of the small species should be encouraged to take up their quarters in our fields and about our plantations. A few might be spotted with the black mark to be severely dealt with in ways varying with the species. Certainly a part of the cost of upkeep in every well-settled district will need to be expended on the annual subjection of Sparrows and Starlings. Beyond these birds, each district, according to varying climatic conditions, needs to battle with its own trouble in its own way. It is very much a matter of food supply. Every labourer is worthy of his hire, and the bird well earns its share, no matter in what part of our continent it may at any time be living. The birds termed "useful" earn their title when placed in relation to the agriculturist, the pastoralist, the orchardist, and the forester.

The illustrations are for the greater part half-tone blocks, and here and now I express my gratitude to the Council of the Australasian Ornithologists' Union for the loan of a number of blocks, the photographers of which have been

duly acknowledged in each case in the list of illustrations, the principal contributor being Mr. Arthur H. Mattingley, the Hon. Sec. of the Union. Of the remaining plates many have already appeared, and been acknowledged, in my recent "Key to the Birds of Australia" and "Glimpses of Australian Bird Life."

PART I.

INSECT-EATING BIRDS.

THE majority of land birds which are included in the order Passeres or Perchers are for the most part insectivorous—that is, insects form the bulk of their food. A certain number, however, though still exhibiting insectivorous tendencies, favour a fruit diet, and in consequence prove themselves troublesome in the summer. These will be noticed in subsequent parts of this book.

In my correspondence with those dwelling in country parts on the question of insectivorous birds, I have repeatedly urged on them the necessity of thoroughly studying the habits of the birds in their particular districts, with the hope that the whole community may be benefited by their observations. Furthermore, I was convinced that a diligent and impartial inquiry into the *pros* and *cons* of the matter would persuade the farmer to hold his hand many times when he is about to destroy some little bird which he, on very insufficient grounds, has come to regard as a pest. The following note from my much-valued correspondent, Mr. Geo. Graham, is eloquent in its recognition of the service rendered by birds to the landowners:—“It is a fact that our insectivorous birds are little known,

and their value less appreciated, by the majority of those who reap the benefit of their work. Thus an orchardist who will note the disappearance of aphids from his fruit trees has not the least suspicion that it is owing to the work of Silver-eyes and little brown Tits. Indeed, he only knows the Silver-eye as a pest on soft fruits. Yet it is probable that no means that he could employ would enable him to grow any fruit but for the busy, impudent, prying little gourmands, existing in greatest numbers where they are most wanted. Most insectivorous birds seem to show preference for special insects. Such a bird is the Harmonious Shrike-Thrush, whose fondness for hard-shelled beetles, especially of the borer kind, makes it a very valuable friend. Often have I watched our Thrush take its favourite beetle from the hiding place to the solid top of a post, and there drive its bill, crowbar-like, into the beetle's shell, break it up, and eat it in pieces. I am convinced our immunity from the borer pest is due to the great number of Shrike-Thrushes with which our locality (Heytesbury Forest) is favoured. The very few who are able to estimate the services rendered to a vegetable garden by a family of Blue Wrens I have found always careful to preserve a little cover, to encourage their stay and assist them in their increase. What we owe to the various species of Flycatchers in preventing the spread of noxious flying insects has perhaps never been correctly judged. These take no toll, and require only an evergreen in which to lodge in return for their labour, or the labour they save. Tree-creepers and Robins, Wood-Swallows and Tits, unlike other workers, the more they eat the better they pay. Out in our open paddocks the bold, alert White-backed Magpie dominates the bird world. Each area has its family—male, female, and young—or else a colony of non-breeders. Such a colony, of about seventy bachelor males and

maiden females, have their night quarters in a row of dense pines surrounding this house. From thence they work the paddocks around not in possession of other Magpies, and the execution they wreak upon the grubs in the grub-infested places is wonderful. Judging from the way they have kept the surrounding paddocks free of grubs, the planting of those pines was the best-invested money on the property. I have come to regard them as a standing army of scavengers, ready to go forth to check an invasion of either crickets, grasshoppers, caterpillars, or any such undesirable visitors. Often during summer and early autumn I have known them go two miles from their camp to distant paddocks where some pest was in force, hunt there all day, and return to their camp late in the evening. Often they are joined on the field of operations by more colonies of Crow-Shrikes from other directions. Then the muster is formidable—three hundred, perhaps more, all working together till the pest gets scarce, then back to their old quarters. During late years their chief occupation through early spring and summer is the destruction of myriads of grub-producing beetles, whose larvæ are such a scourge to graziers and dairymen. The beetles are taken on the wing, and as they fly in greatest numbers just before and after dark, it is usual to find our Magpies hard at work long after twilight. It is somewhat appalling to think of the state of the land if they failed us. I have a short note, made last month (July), as follows :—‘ Watched White-backed Magpie digging out grubs in fowl-yard ; dug out and ate 30 grubs in ten minutes, this one having struck a rich patch that had not been previously worked by others of its kind. The fowls did not know the succulent grubs were there, just beneath the surface, but the Magpie, having the better training, it would watch and listen intently for a few seconds, then, guided by eye or ear, it would run from place to place, and each time, with unerring certainty, dislodge a grub. No doubt the less

resourceful birds that feed over the same areas, such as the Magpie-Larks, Ground-Larks, White-fronted Chats, Acanthizas, Flame-breasted Robins, together with Cranes and Plovers, take the lion's share of such food that is found above the surface, thus compelling the Magpies to become the superior insect-destroyer and the better servant to man.' "



THE MAGPIES.

THE Australian Magpie differs widely from its European namesake; indeed, the name as applied to the Australian species is somewhat of a misnomer, its correct name being "Crow-Shrike." The appellation "Magpie" was bestowed on the bird by the early settlers, who saw in the Crow-Shrike certain external resemblances to the "'Pie" of the English countryside. In deference to popular opinion, I shall retain the commonly accepted title.

The Crow is the Magpie's next of kin, both apparently having arisen from a common stock.

Young Magpies are unlike their parents in colour, being a uniform brownish-black. On the theory that the history of the race is epitomized in the development of the young, this would seem to point to a time in the past history of the Magpie group when, in place of the thirteen species or varieties at present known, there existed only one brownish-black form, the ancestor of the whole group. Through a slow process of evolution, extending over a lengthened period of time, and involving endless change of circumstances, the Magpies of to-day have descended from this brownish-black species.

The Bush-Larks offer a good example of the manner in which evolution works among our southern birds. Those inhabiting the grassed lands of the coasts are greyish-brown in colour. If we examine those found in the desert country of the interior we shall find that a great change has taken place; the birds have adapted themselves to the colour of the surrounding soil, whatever colour that may be. Thus, on rufous soil the prevailing tint of the Bush-Lark is rufous, and on grey soil grey. The primary object of this change of

colour is that of protection from enemies, for so closely do the birds simulate their surroundings that it is most difficult to perceive them in their natural haunts. To the naturalist, however, a second interest attaches to the change of colour, for he finds therein sufficient grounds for regarding the variously coloured larks as different species.

White-backed Magpie

(WHITE-BACKED CROW-SHRIKE),

Gymnorhina leuconota, Gld.

Jim-nō-rī'nā lū-ko-no'ta.

Gumnos, naked : *rhinos*, nostril ; *leukos*, white ; *noton*, back.

GYMNORHINA LEUCONOTA, Gould, "Birds of Australia," fol., vol. ii., pl. 47.

KEY TO THE SPECIES.—*Adult male*—Whole of back pure white, like neck and rump ; throat and breast black ; bill pointed and slightly hooked ; nostrils bare of feathers, and placed about the middle of the bill (longitudinal slit).

Adult female—Similar to the male, but not so white on back.

Young—Whole of back clouded with grey.

THOUGH Magpies are not wholly gregarious, they are generally to be seen in families of two to five members, occupying a small area, which they preserve against the encroachments of all intruders. Sometimes a pair, or the occupiers of a block, will not breed for one year, but they generally breed as usual in the following summer. Magpies are doubtless fond of wheat, but they much prefer the luscious grasshopper, a horde of which they will attack in a manner most beneficial to the agriculturist. Their dependence on insect life as a staple article of diet is well illustrated by the fact that during the season 1897-98 many young Magpies died of starva-

tion in their nests because of the scarcity of insects in several parts of the Wimmera. Just as spring seems to come first to the plants near sea levels, and later to the "alpine" forms, so does this species build a nest earlier in the valleys than on the hills. This seems to be true even as regards the small difference of 300 feet.

The young birds remain with the old ones until they are quite full-grown, and it is only when they are forcibly driven away by the parents that they will face the world "on their own." The keen observations of Mr. Geo. Graham, recorded in his letters to me during August, 1898, state clearly the case of forced individual migration :—"Three out of seven families that occupy my paddocks have with them each a bird of last season's breeding, and to all appearance it intends to stay with them throughout the summer. When the next brood is incubated the family will increase from three to five—two always being the number of the brood here (Heytesbury)—and, providing there are no accidents, it remains until about next May, when one disappears, and shortly after another goes. At this time there is a deal of chasing among the Magpies, and I have concluded that it is the young male that is being driven away. The young male becomes blacker and darkens sooner than the female, as well as I can judge. I think the parent male would not permit the opposite-sexed young also to remain in camp during spring, so the junior male has to go. If the young male should be allowed to remain with the parents into the next season it does not mate during its first year. I have also noticed the adult females of two families trying to drive away the young females by repeated attacks of sometimes thirty minutes' duration. The old bird would pin the young one to the ground, but it seemed to have no other effect than to make the young one afraid of its mother. The male parent stands by, looking on, and takes no active physical part in the contest. In both cases the

youngsters stood the ill-treatment till the duty of nest-building compelled the dame to leave them in possession. After the young of the new brood are hatched out it is amusing to see the dejected attitude of the oldest daughter (unmarried) when the mother happens to approach it in quest of food for the new brood. In May or June following it disappears, and probably begins housekeeping on its own account. Just at this time a new patch of forest has been opened up, and, if only a few acres, a pair of Magpies will find their way into it. But all is not complete yet, as someone has shot the male because it thrashed his domestic fowls. The female cleared out at once, and returned in a few days with four males, the strongest and best fighter eventually becoming her mate."

It is interesting to direct a field-glass on a parent bird with a nest of young. You can see her fill her mouth with insects almost to overflowing, then fly into the nest and equally distribute the collection to the ever-hungry youngsters.

My friend, Mr. W. J. Stephen, has a female bird, taken from a nest four years ago, which is a splendid talker. In the spring of 1897 an inclination to sit was observed. The following year (August), as with wild birds, it showed a similar desire, and some assistance was given as soon as it showed itself in earnest. My friend was good enough to keep a rough diary for me during nest-building, which shows how the bird, in spite of being turned out of its chosen spot several times, persisted in building a nest, using for preference pieces of wire, stiff twigs, and also some strips of stiff white calico, but, strangely enough, rejecting pink flannelette.

I know of a semi-domesticated pair of birds that have lived and reared their young in a garden at Box Hill for five consecutive years. They added to and renovated their first nest up to the third year, and built a new one for the fourth year. That they were the same pair of birds I am convinced, for the male bird had, by some mischance, received a hurt which

broke one of its legs, early in 1893. This broken member served as a good recognition mark. A pair of this species living at Pakenham has reared three families of young without any black pigment in their plumage, but these albinos do not seem to live long in captivity.

Nest.—Cup-shaped; large; formed of sticks externally, grasses and hair internally, and nicely lined; placed high or low according to the size of tree available.

Eggs.—They vary considerably in colour. The ground colour may be light green, light brown, or intermediate shades; the markings may be streaks and blotches of chestnut, reddish-brown, or varying brown; some will be heavily blotched, others will be lightly so. Clutch, 3 to 4. Length, 1.5 inches; breadth, 1 inch.

Black-backed Magpie

(PIPING CROW-SHRIKE),

***Gymnorhina tibicen*, Lath.**

Jim-nō-rī'nū ti-bī'sen.

Gummos, naked; *rhinus*, nostril; *tibicen*, a flute-player.

GYMNORHINA TIBICEN, Gould, "Birds of Australia," fol., vol. ii., pl. 46.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 6, 7.

KEY TO THE SPECIES OR VARIETY.—Black band across white back; throat and breast black; bill pointed and slightly hooked; nostrils bare of feathers, and placed as longitudinal slits about the middle of the bill.

THIS bird appears to me as a variety rather than as a species. Gradually the black bar of the back is evolving away, and it is more than probable later generations will recognize in these present species a type common to the whole

of the continent, with a back quite white. What interests us most at the moment is its utility in the order of things.

“Fifty birds devouring 140 grasshoppers each in a week would account for 7,000 insects. Supposing on a meagre estimate a grasshopper would eat a square inch of grass-blade per day, then the farmer would have 7,000 square inches of grass for his stock which would not have remained his but for the Magpie. So the service rendered by this much-abused insectivorous bird is quite incalculable.”—*Emu*, vol. i., part 1, p. 15 (1901).

During certain times, as when the seed grain is in the ground, the “’Pies” are not in favour with every cereal-grower, but that they destroy the prospect of a crop at such time is not substantiated by actual experience. That they do some harm is incontrovertible, as evidence many stomachs full of grain. At the same time that these minor pilferings undeservedly blacken the Magpie’s fair fame, the fact is lost sight of that soft-bodied, injurious vermin are very much reduced in number.

For eleven months of the year the bird is indispensable to the grower, doing what other birds never do, and eventually adding its quota to the handsome results the quality of the ground, with a minimum of pests, has given. But for the Magpies the cleaning of our grounds would periodically cost us heavy sums, and like the “whin,” when let alone for years, the amount would rather shock us when the evil day could no longer be staved off.

Something of this handsome bird might be said with advantage in a homely way. It appears that in captivity Magpies show an aversion to anyone who has annoyed them, as well as to anyone who looks like the person who has annoyed them. The voice of the offending person is quite sufficient to agitate the bird and cause it to rush post haste towards its tormentor to wreak a terrible

vengeance. Although it is principally children and ladies that they have a grievance against, some children and ladies pass by as very good friends.



Black-backed Magpies and Nest.

That Magpies can be very pugnacious is a fact well attested by many visitors to the garden of a friend who keeps a pet Magpie.

Magpies fly at one for a reason similar to that of a hen with its chicks in danger. The male bird, and not the

female, appears to be the attacker of man, and the attacked is not only a man, woman, or child, but may be a dog or a species of small bird, or, more commonly, a Hawk or Crow. Small birds as Robins and Acanthizæ, that are breeding in close proximity to the Magpie, may have their nests pulled to pieces, the young destroyed, or even the old birds themselves killed if they can be caught. Maggie, in this respect, is a brutal bird. Both male and female attack Hawks. The Magpies fly desperately at a person when either eggs or young are in the nest, but later their pugnacity ceases. In individual cases the Magpie will keep the pugnacious temperament very strongly for some weeks, or even months, and woe betide the unwary who should meet such a hot-tempered bird. In breeding season it recognizes its arch-enemy, man, whether on horseback, on a bicycle, or in a buggy, and for a considerable distance from its nest it will follow and make war on him—lucky the man who escapes with nothing worse than a perforated hat! The bird, I consider, has learnt by direct experience to regard mankind in the light of an enemy—experience, I say, because in the remote and sparsely-populated districts, where the birds are not subject to the persecutions of schoolboys or other egg-hunters, they are of a much milder disposition. As one approaches the towns their ferocity increases.

I have examined a number of nests in various parts of the Mallee. Although in the majority of cases these nests contained young, the old birds flew away at my approach, perched on a neighbouring tree, and from this vantage surveyed my doings without offering any resistance whatever. Even as near Melbourne as Point Cook I have found the Magpies very mild in disposition. As a school-boy I visited this part, accompanied by a school friend, and took fifteen young birds from five nests; in no one

case did the parents fly at us. Their trustfulness arose evidently from the fact that the particular portions over which we roamed had for some time been closed to the public, hence the Magpies were immune from persecution.

I know of a Black-backed Magpie which had been living for three years in the domesticated *rôle* suddenly developing a desire to build. She chose as the site of her home a peach tree in the orchard surrounding the house. Not having full freedom, the bird could only work at the nest between 7 and 9 a.m. and after 5 p.m., and on the whole of Saturday and Sunday. The nest was placed 7 feet 6 inches above the ground, compactly built of twigs and slightly lined with feathers. The whole breadth was 14 inches, that of bowl 4.5 inches, and depth of cavity 2.5 inches. In October three eggs were laid in it, and the dimensions averaged — diameter, 1.08; axis, 1.5 inches. The colours were also normal — ground bluish-grey, under markings purplish, over markings dark brown.

It is rarely that either of these species lays five eggs to the clutch, but cases were reported to me in 1897.

Mr. H. S. Burcher, of Mossgiel, New South Wales, on 15th September, 1898, writes to me:—"I noticed a very remarkable incident last week in the finding of a Black-backed Magpie's nest with five eggs. This is quite out of the ordinary for a Magpie here, as it is the first time I have ever found five eggs in a nest. I left them during the first time to make the note you wrote for, when, on passing the second time, I found, to my surprise, the five eggs had gone, although the birds were still there. Noticing the inside of the nest was not so deep as before, I pushed my hand further down and felt the five eggs. It seems that they had built a thin lining over the eggs, which I first thought was to hide them away; but I found out after they had made a partial new nest on top of the other and

laid another clutch. The first set of eggs was poorly developed, and fairly easily blown. Between the laying of the two sets of eggs there was an interval of some fourteen days, including the time occupied in depositing the second clutch."

Nest.—Similar in every way to the previous species. Both are placed in the forks of perpendicular branches.

Eggs.—The specimens taken from five different nests show very varying differences. The ground colour will be pale green or brown; the spots may be lilac or chestnut, and the streaks of the same. Clutch, 3. Length, 1.5 inches; breadth, 1.1 inches.

MAGPIE-LARK

(MUD-LARK, PE-WIT),

***Grallina picata*, Lath.**

Gra-li'-na pik-a'ta.

Grallæ, stilts; *pica*, a magpie.

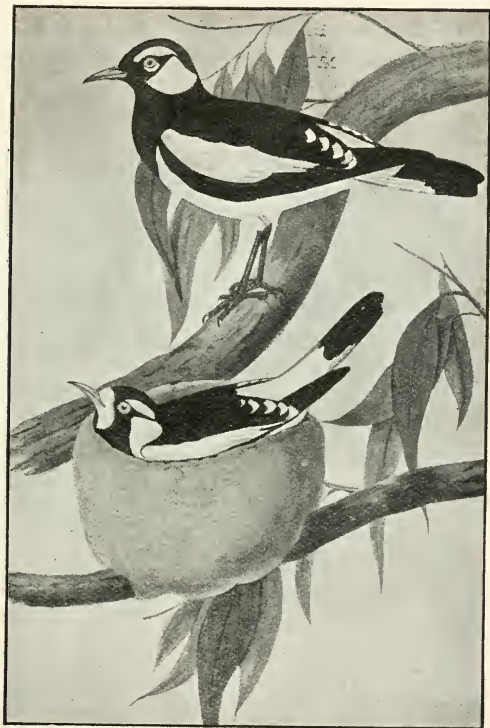
GRALLINA AUSTRALIS, Gould, "Birds of Australia," fol., vol. ii., pl. 54.

GEOGRAPHICAL DISTRIBUTION.—Areas 1 to 9 inclusive; accidental in 5.

KEY TO THE SPECIES.—Breast black; under parts pure white; throat white in female, black in male; upper surface black; bill broader than it is high; second primary longer than the secondaries.

THIS is a broadly distributed and most useful species. Fruit-growers and market gardeners have learned to recognize its value and welcome its company in their areas, for this so-called Mud-Lark adds greatly to the life of a place with its pretty "pe-wit" and graceful ways. The Western Australian birds vary in their call notes very considerably from those of Eastern Australia.

The charm of the bird is best exhibited when it is gracefully walking on the green banks of creeks and shallow ponds, where its black and white plumage affords a most agreeable contrast to its surroundings. But the fairy form it then



Magpie-Larks, male and female.

presents is lost as the gentle creature leaves the earth for higher realms. Such clumsy flight as it then indulges in would scarcely be expected of so lovely a creature as seen on the ground. Water in creeks and pools generally harbours

snails, which are often found to be the hosts of the "sheep fluke." This bird, in common with the White-fronted Heron (Blue Crane), makes war upon the mollusc hosts, and thus considerably reduces the danger and loss, especially to our western graziers.

Nest.—Cup-shaped; made of mud, and lined internally with grasses; placed near water, and generally in a eucalypt on a horizontal bough.



Young Magpie-Larks.

HOUSE-SWALLOW

(WELCOME SWALLOW),

Hirundo neoxena, Gld.

Hi-run'dō ne-ox'enä.

Hirundo, a swallow; *neos*, new; *zenos*, strange.

HIRUNDO NEOXENA, Gould, "Birds of Australia," fol., vol. ii., pl. 13.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7, 9.

KEY TO THE SPECIES.—Forked tail; throat rust-red; abdomen white; ear coverts glossy blue, like back.

IN 1896 this beautiful species of the air departed from its usual custom of migrating northwards, and was quite content, on account of the moderately mild season, to remain throughout the year in the extreme south of the continent. In March of that year the birds assembled in hundreds in the main street of one of our southern cities, inclining me to the belief that at least one contingent was preparing for the annual journey. They settled on the projecting mouldings on the third floor of a five-storied building, each bird uttering a single note, which collectively constituted a din of weak voices. A flock of several hundreds—apparently on their return journey—entered a large school building in a country town, much to the amusement and interest of the assembled children. Agriculturists ever welcome the House-Swallow as one of their best friends, and it was well for those dwelling in this wheat-growing district that the flock kept the even tenor of its way.

In March three features are observable about these birds. Firstly, that they are extremely combative. One pair I noticed for several minutes engaged in a fierce duel while on the wing. Having ascended to a high altitude, they chased each other downwards, alternately becoming pursuer and

pursued, and presenting an appearance as of comet-like objects floating rapidly through the air, chattering incessantly. Secondly, the male is a vocalist with a considerable amount of ability, for if the sun be shining, as it often does at that



House-Swallows.

time in this bright country of ours, he produces a strain of music continuous for many minutes, the while resting upon a post or other suitable object. As it now wishes to choose a partner for the next and following months, it must needs be

busy with the duty of the season. The song poured forth is no doubt an appeal to the fickle female, who is apparently charmed in this manner by her lover. Thirdly, owing to the amount of moisture regularly falling upon the ground, they find a part of their sustenance there.

As one floats above the short grass, the little body assumes an ovate form, and the tail feathers become lowered. The short legs prohibit them from standing anywhere other than on a flat surface, and it is not unusual to have them rise from the asphalt path as one approaches.

Swallows gather moths and other insects from the grass as they rise, noiselessly hovering within a few inches of the surface, and at times appearing motionless.

On the 3rd of April I was interested in watching 14 Swallows skimming the surface of the Surrey Hills reservoir. This was at 4.45 p.m. Soon the active flock became 23, after which the number quickly reached 70. The arrivals all came from the south, in companies of from 12 to 18, and the assembling continued until the number totalled about 200 in thirty minutes from the arrival of the first group. The sun was brightly setting, and the weather mild. The scene above the artificial lake was truly a pretty one. The distant birds were of apparently small proportions and light colour, while those in the foreground were large and dark, and all gliding in giddy circles till one almost imagined the whole scene was in revolution. I could then realize forcefully the application of the poet's lines,

“The thin-winged swallow skating in the air.”

As the light faded at 5.30 p.m. the flock, as though following some concerted action, departed in an instant, and I was left to contemplate, with only a faint idea that they had moved northwards to their usual roosting-place in a group of timber some distance away.

It surely goes without saying that everyone is familiar with the Common or Chimney Swallow, yet such facts as the following, gathered by the writer and an able correspondent, Mr. Geo. Graham, may appear new to many in the natural history of the species :—

Nesting Habits.—The species starts to nest in July if the weather be favourable, though the month will vary with the season and latitude. It is an early and late breeder. The position chosen for the nest is very varied; they may be placed in caves, spouts of trees over water, in barns, under verandahs, and even in a dog-kennel, if the dog has been absent some time. In the latter position a pair of birds has been known to breed for five years (per Mr. C. Gabriel). Even the floating gate of a graving dock has its nest, under one of the iron ledges.

Whether or not the birds resort to the same nest annually I cannot say, but since 1881 two nests in the same hollow of a tree have been occupied each year during the whole 16 to 17 years up to 1898. One of these nests was pulled down in the sixteenth year, prior to the return of the birds, and was not rebuilt. I take it the birds were turned aside from the usual custom and went elsewhere.

In the building of a nest the birds occasionally make a mistake, and yet persist in continuing with the work. If the nest falls they start again, and a second time it falls, and so on until success is achieved or the work given up. On other occasions nests are partially built and abandoned. A pair will start a nest, and by the time it is half done a number of Swallows assemble, fly to and from the nest, twitter considerably, and work is suspended, apparently as a consequence of their deliberations. Such nests are not again touched.

It is interesting to know that a House-Swallow in England hatches its eggs in exactly the same time as one in Australia. The following four observations show—(a) an egg is laid on

each consecutive day; (b) the clutch takes 15 days to incubate; (c) the young open their eyes on the ninth day; (d) the young left the nest, in Observation I., in 24 days; in Observation IV., in one calendar month (30 days).

Observation I.—August–September, 1899, Heytesbury, Victoria.—To last year's nest, in the much-weathered hollow at the base of a eucalypt trunk, the birds commenced additions as early as the 6th August, and by the 13th a new tier of plaster, 1 inch thick, was laid. Immediately following this an inner lining of rabbits' fur, feathers, &c., was fixed in ample time for the first egg. First egg deposited in nest 23rd August, second egg 24th August, third egg 25th August, fourth egg 26th August, fifth egg 27th August. The birds immediately sat, and brought out five young on the 11th September. On the 4th October young left the nest for the first time.

Observation II.—September, 1899, Heytesbury, Victoria.—To experiment, the old nest was broken away and taken quite out of sight of the birds. This gave an opportunity to find the time required to build a complete nest. The operation commenced on 7th September, and by the 19th instant the earthen cup was finished. By the 30th instant the lining was fixed, and an egg was laid. Without giving any clear explanation, the owners made no further advance with this nest, and the single egg remained unincubated.

Observation III.—October–November, 1899, Heytesbury, Victoria.—The first egg was deposited in nest on 12th October, and a second on the following day. Several days' watching showed no further development. Considering the nest was abandoned, the observation ceased. Passing the nest some weeks later two young were found to be progressing favourably.

Observation IV.—October–December, 1899, Heytesbury, Victoria.—Nest in bole of eucalypt. The second egg was deposited on 18th October, the third on 19th, and fourth on 20th. By analogy with this species, the first egg was laid on the 17th October. On 5th November the young hatched out, their bodies being rather nude, and the down grey. The eyes opened on 14th November. Young growing rapidly on 17th November, quills well out and showing grey tufts. By the 19th instant the grey is giving way to black, with chocolate on throat and vent. At this stage the young are so strong, and cling so tenaciously to the nest, that it is dangerous to take them out for examination, especially on the 22nd instant, when the crown and back are dull black. On 5th December the young left the nest for the first time.

When it is found a clutch of eggs will not develop, certain birds, such as the Black-backed Magpie, place a false flooring to the nest, thus covering the eggs, and immediately re-lay. Judging from the following note it is most probable the Swallows do not follow this method, but rather turn out their eggs when they are proved infertile:—"In a hollow trunk that has been used for 15 years," writes Mr. Graham, "I found the nest, freshly lined with feathers. Shortly afterwards I felt an egg in it, and on the following day two additional, thus proving carelessness in my touch, or that three eggs were laid in 48 hours. I do not believe an error was made on my part. On the fifteenth day all three eggs disappeared. About nine days later three more eggs were found in the nest, and they are there now (weeks later), probably infertile, as doubtless were the others. There are no rats, cats or bird-nesting boys in this neighbourhood, so I venture to think the birds, finding no young came on the appointed day (fifteenth), threw them out."

Young.—Providing for the young necessitates the parents visiting the nest every three minutes. I am inclined to con-

clude that the visits are paid alternately by the male and female birds, for of twenty which I observed made to one nest in an hour each sex made ten. If only one nestling is supplied at a time, each of the five in the family would thus be fed every fifteen minutes.

After the young have quitted the nest for the first time, they return during the heat of the day for several days following. The pipe in the tree above the nest serves the family as a night camp for 10 to 12 days after the young have made their introduction to the outside world. The non-sitting bird camps in a place apart from the nest during the period the nest is tenanted.

While the majority leave the district during the early autumn, a few remain, and then the old birds sing or twitter as well apparently as in the spring. It is not unlikely that this is a training for the remaining young, in preparation for the following spring or summer.

Introduced Enemies.—The fox and cat from the mother country cause considerable trouble among our birds. The cat, at the moment, I have noted, is raiding the dry parts of North-Western Australia just as the fox is doing in the south-eastern portion. I know of a hall in a country house in which a nest has been built by Swallows. Two nails below the nest serve as perching places for the two birds. In six weeks previous to 1st October 1898, seven birds were killed by the cat that kept its place in this lobby. If one of a pair was caught the mate would go away for a period varying from one to three days, and then return with a consort. In a day or more one of that pair would be captured, and away the other would go for a mate and return with it. As to which sex was killed my informant could not say, but I should think the same one, and furthermore the stranger, thus showing the persistency of one bird to follow up an idea, just as one of the same species will start to rebuild its nest after

it has been purposely knocked down on four occasions within a month.

In those districts where Swallows build mostly in burnt-out trees, the fox makes a thorough inspection, and all that are not more than 6 or 8 feet above the ground sooner or later are precipitated, sometimes when empty, at other times when containing the sitting birds. The fox scrambles up the distance and grasps in its mouth nest and bird. It seems most unfortunate this scourge should have got among our terrestrial fauna, of which that beautiful form, the *Menura*, has not suffered least.

Nest.—Open, made of mud, and cup-like, the inner lining being of feathers or grasses.

Eggs.—Ground colour white, much spotted with ruddy-brown or faint lilac. Clutch, 4 to 5 eggs. Length, 0.75 inch; breadth, 0.5 inch.

FAIRY MARTIN

(BOTTLE SWALLOW),

***Petrochelidon ariel*, Gld.**

Pet-ro-kel-id'on ā'riel.

Petros, a rock; *chelidon*, a swallow; *ariel*, a sprite.

COLLOCALIA ARIEL, Gould, "Birds of Australia," fol., vol. ii., pl. 15.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 5, 6, 7, 9.

KEY TO THE SPECIES.—Under surface whitish; throat with tiny black streaks; entire head rufous; rump creamy-white; tail forked; nostrils without any superior membrane. round and exposed.

THIS fairy-like Swallow arrives in the south towards the end of August, and leaves again for the north in the summer, though if the winter be a mild one many flocks remain

throughout the year. The Fairy Martin has a distinct partiality for those spots in which there is plenty of water, yet they have been found to occupy almost dry creek beds, where they build their nests, apparently without greatly feeling the lack of moisture, for they thrive well, and rarely leave the immediate vicinity.

The generic name originally applied to the Fairy Martin—*Lagenoplastes*, from *lagena*, a bottle or flask—is specially *apropos*, for the shape of their mud nests is that of a bottle, with the neck facing outward. They are fastened to the side of a cliff or under a bridge, and are usually associated in colonies of from 20 to 40 nests, each one representing a pair of birds. Evidently the birds return to their own particular colonies in the spring, for each year the old nests are patched up and used over again. Normally the birds work only in the cool of the day—that is, in the early morning and evening.

A system of co-operation prevails in these merry colonies, in so far as half a dozen birds will combine to build each nest, placing them from 3 to 7 inches apart, and if at any subsequent period a nest should happen to receive an injury, the whole colony assist in the repairing process without a thought of mine or thine. In less than fifteen minutes several thousand mud “bricks” have been carried and plastered together, and order has been restored. When finished the interior of the nests is thickly lined with grass and feathers, thus providing a warm and cosy receptacle for the eggs and later for the young.

Mr. Price Fletcher, in a private diary, says:—“Unfortunately this curious and closely constructed home is no protection against some of its feathered foes, for I have seen the Red-rumped Kingfisher, instructed doubtless by its habit of breaking into the tree-ants’ nests in order to make a nesting place for its own eggs and young, make persistent war on the

colonies of Fairy Martins. The Kingfishers fly up, catch the end of the neck or entrance spout in their beaks, and gradually break it off until they reach the eggs or young, which they ruthlessly devour. I have known the pretty little Pardalote, or Diamond-bird, which usually builds a nest at the end of a tunnel 2 feet long excavated in some sandy tank, deliberately take possession of one of those spouted nests of the Fairy Martin, and hold it against all opposition from its original constructors, and safely rear a brood of young."

I am informed of another case, in which an introduced Sparrow took possession of a nest that was nearly completed by the Martins. As this Sparrow absolutely refused to leave the nest, the Martins built it in with mud. Perhaps it was sick and could not leave. In any case, my informant released it.

Nest.—Made of mud, with a retort-shaped neck, the funnel extending from the bowl several inches; the inner lining is composed of grasses and feathers. A colony of nests is placed under a bridge or on a bank.

Eggs.—White or white spotted with tawny brown; the spots may be distributed over the egg or at the larger end only. Three to five generally for a sitting. Length, 0.7 inch; breadth, 0.5 inch.

TREE-MARTIN

(TREE-SWALLOW),

Petrochelidon nigricans, Vieill.

Pet-ro-kel-id'on nig'ri-kans.

Petros, a rock; *chelidon*, a swallow; *niger*, black; *cano*, to sing.

COLLOCALIA ARBOREA, Gould, "Birds of Australia," fol., vol. ii., pl. 14.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7, 9.

KEY TO THE SPECIES.—Under surface whitish; throat whitish, with tiny black streaks; frontal band sandy-buff; rump whity-brown; tail forked; nostrils without any superior membrane, round and exposed.

OF every hundred intelligent people who see Martins in the woods or near bridges, I feel sure ninety-eight never distinguish this species from the second Martin of the genus (*P. ariel*, Gld.) That is because there is practically but one difference, which in the distance is not discoverable without the aid of field-glasses. One has the forehead rufous only, the other has the forehead and crown rufous, these characteristics being constant. They have similar habits, and very often occupy the same natural surroundings. *P. nigricans*, as well as I know, stays for the winter, and breeds in holes in trees, while *P. ariel* prefers creek banks and cliffs, against which they build, or bridges, under which large colonies of nests are often to be found.

Being strictly arboreal, the Tree-Martin hunts in flocks, feeding largely upon micro-insecta. In this respect it is invaluable as an insect exterminator, rendering a service that few other birds can equal. When each ninth or tenth generation of the aphid comes into existence, the birds display wonderful activity in their destruction.

While the Fairy Martin feeds in a lower stratum, upon the

rivers, and the swifts in a high stratum of air, this species, in common with the House-Swallow, works the intermediate one. That is to say, different kinds of insects, which live in different strata of air, have different kinds of Swallows to keep them in subjection. There is also a Black and White Swallow (*Cheramœca*) that keeps to the dry interior, doing good duty by maintaining a balance in these parts.

Nest.—Hollow of a tree limb, with decayed wood as a base.

Eggs.—White, spotted with reddish-brown at larger end, more or less. Three to a sitting. Length, 0.75 inch; breadth, 0.5 inch.

MASKED WOOD-SWALLOW,

Artamus personatus, Gld.

Är'ta-mus per-son-a'tus.

Artamos, a butcher; *personatus*, masked.

ARTAMUS PERSONATUS, Gould, "Birds of Australia," fol., vol. ii., pl. 31.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—Under surface of the body beautiful grey; rump and upper tail coverts clear ashy-grey, like the back.

Male.—Face and throat jet-black.

Female.—Lighter in markings of head and throat.

THIS bird is strictly insectivorous. At times it is most unpopular with the beekeeper, whose winged helpmates suffer considerable havoc wherever the Wood-Swallow has access to his apiary. As a matter of fact, it is known in some districts as the Bee-Martin. A market gardener informs me that the Wood-Swallow renders signal service in the orchard by destroying numbers of the odorous pear slug, which gives off

“an odour so powerful that we are obliged when picking fruit to keep to windward of greatly infested trees, and leave them to the care of hellebore and Summer-birds.”

The ordinary note of the bird is a quick, rasping one, that jars somewhat on the ears of the listener. During spring, however, the male bird feels called upon to lay aside its croak at special moments, and courts the members of the gentler sex by pouring forth a bar of melody, which, though superior to



Nest and Eggs of Masked Wood-Swallow.

its usual efforts in this direction, still falls feebly and brokenly on the ear of one who would naturally expect a better result from so great an effort. Nevertheless, it is a decided advance, and evidently is effective in charming the member for whose benefit the effort was made. The bird reverts to its usual note at a very early period after courtship.

In 1895 I noticed that this species did not build as early as in the following year, and, moreover, that in the majority of

cases nature favoured the depositing of two eggs only to the clutch. Of eighteen nests personally observed five contained each three eggs, eleven contained each two eggs, two contained each one egg. The young generally were well advanced in the eggs. Other nests observed by myself each contained two full-feathered young only.

Like many other birds, the Masked Wood-Swallow resents the approach of an enemy near its nest, and angrily and boldly attacks all intruders. The female bird, perhaps, is rather more retiring than the male, who darts at one persistently while in the vicinity of the nest.

One Christmas Eve I observed that two young were about to fly from a nest built in an odd-looking piece of dead timber near the ground, which I had watched for eight days previously. One would serve as a cabinet representative specimen, so I withdrew it at 7 p.m. For an hour and a quarter I remained fifty yards away, watching other birds, and returning at the end of that time I found the parents had removed the remaining young Swallow, probably for preservation sake.

Meanwhile I had extracted three fresh eggs (the third one laid the day previously) from another nest of this species, and placed therein the young bird mentioned above. The layer of the eggs, returning shortly afterwards, looked astonished, but immediately and carefully gathered the young bird under its wing. Continuing this mild experiment, I now extracted the young feathered bird after it had been there for fifteen minutes, and placed a member of the White-browed species, born two days previously, in the nest. The proprietor returned, and despite the fact that the young this time was almost featherless, it behaved precisely as on the previous occasion, and carefully covered the new arrival as if it had been its own. The loss of three eggs was apparently a purely philosophical consideration. This young bird was taken through

its cradled course of life nine days later, and released on the same day as the two in the nest from which it was removed.

The young of the previous species at 24 hours of age are downy and well stored with vitality. The last movement of one made in methylated spirit was the drooping of the neck and head upon its chest after $20\frac{1}{2}$ minutes had elapsed from the time of placing it in the bottle.

The majority of nests are loosely constructed, though occasionally, if fibrous roots be easily available, they are used, with the result that a compact, neatly arranged nest is built. The constructive material is gathered in the immediate vicinity of the spot chosen for the nest, the birds seldom moving far in search of material.

An example of this habit can be easily noticed in a region wherein a fence divides an orchard from a gorse field. On the orchard side, 10 yards from the fence, the nests are constructed wholly of fruit tree fibrous rootlets, while on the gorse side each nest is composed of the grasses and twigs that can be readily gathered amongst the bushes. There are, of course, exceptions to this rule.

Three characters of combinative material appear to be used, though they pertain possibly more to local influences, and may have but little weight in a wide study of the Artamidæ:—1. In orchards, rootlets of the trees, internally fine, but with coarse mantling. 2. In lightly timbered paddocks, grass stems principally, chlorophyll-bearing before completion; occasionally a few horsehairs. 3. In well-timbered country, twigs of the trees, with a finer internal lining of linear leaves.

The bowls of all the nests are similar in dimensions, but those of the complete structure may vary occasionally up to twice the normal measurements. The positions, as with the previous species, generally range about 6 feet, and often only 2 feet, above the ground. Occasionally nests are placed higher, but, excepting where *Pinus insignis* and a few species

of eucalypti are used for building in, the rule is low to mother earth.

The two species build promiscuously, favouring a brake of low scrubs. The nests are placed in prominent positions, each species as a whole keeping apart, though in certain instances members of both species nest close together.

By the middle of December many of each species were preparing homesteads for the third brood, and they seldom use the nests of a past family for a future one. Late builders were observed in the early portion of January carrying twigs. After sundown those birds not engaged in the night caring for the young or eggs congregate in bodies of from 10 to 15 close to each other in a tree or shrub convenient to the nests and near the ground, and there pass the night.

With both kinds I find an egg deposited each day, and the first of the clutch hatches out on the twelfth day of sitting. The young of the two species fly upon the eleventh or twelfth day from hatching, subject to a slight variation in a number of broods.

Nest.—Saucer-shaped; twigs externally, with finer grasses within them; very flimsy or neatly made. Further reference above.

Eggs.—Two or three, sometimes four, to a sitting. The under surface may be light brown, or occasionally light green, and all blotched with light or heavy brown. Length, 0.8 inch; breadth, 0.7 inch.

WHITE-BROWED WOOD-SWALLOW

(MARTIN, SUMMER-BIRD),

Artamus superciliosus, Gld.*Är'ta-mus sū-per-sil-i-ō'sus.**Artamos*, a butcher ; *super*, over ; *cilium*, eyelid.ARTAMUS SUPERCILIOSUS, Gould, "Birds of Australia," fol., vol. ii.,
pl. 32.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6.

KEY TO THE SPECIES.—Under surface of body vinaceous chestnut : a
broad white eyebrow ; bill long and pointed, the culmen exceeding
the length of the hind toe and claw.

THE White-browed Wood-Swallow shows a remarkable instinct in the choice of a locality where insect life is specially abundant. The decision is evidently arrived at some time previous to their return from the North, though how the knowledge regarding the suitability of the chosen areas is arrived at is a matter shrouded in mystery.

It is also noticeable that a certain number are associated with a distinct area, to which they jealously keep, deriving a deal of their sustenance from the grassed lands, over which they move by a series of hops and jumps.

Often a single bird, chattering incessantly, will settle upon the upper portion of a tree, some 20 feet above the ground, and from this point start out in pursuit of some winged insect which, unfortunately for itself, has come within the bird's purview. Returning, it essays another chase, continuing to repeat the same for a considerable time, soaring downwards and winging its active upward way by a series of rapid flaps.

Previous to entering upon the serious business of their life, that of nesting, the birds assemble in flocks in the higher

leafy vegetation, and produce a din which one would scarcely expect from such small and graceful birds. The harsh, sharp, powerful chirps, continuously repeated, grate unpleasantly on the nerves of anyone in the vicinity, offering a sharp contrast to the quieter notes of the sobered parents 21 days later. I remember a large flock of the Swallows taking possession of a cluster of timber in which were a Black Fantail, its mate, nest and eggs. Only occasionally could the little bird be heard during the day. It was only after the Swallows had retired for the night that the sweet notes of the Fantail could be heard with any force.

Two weeks after their arrival in the South, the Wood-Swallows show a wish to commence nest-building. The more rapid workers complete their structures in one or two days, and others, more dilatory, and exhibiting, like many human beings, a strong desire to introduce play into their work, delay the completion for several days.

I discovered a clutch of eggs on 8th November, though many birds, still in flock, had not commenced to build on 17th of the same month. Young birds were noticed on the wing as early as the 23rd. The nestlings amusingly imitate their parents in the perpetual horizontal and perpendicular movements of the short-plumaged tail, proving in this way the force of inherited habit.

A fledgling which I took from a nest announced its removal by two calls, one imitative of the general note of the mother, but more broken and feeble, and the second, emitted after it had been away from the nest 15 minutes, of fear. This bird I endeavoured to rear, but without success; it refused to eat, and, in consequence, died in a few days.

The eggs mentioned above varied in markings slightly, with a deep or light ground colour; one egg in a set of three had the zone of spots at the narrow end, the other two were normal. They differed on the average only a shade in dimen-

sions, and in the number to a clutch from four to two. Of twelve nests observed, three contained four eggs, six three eggs, three two eggs—all well incubated.

The nests, though slight in structure, are generally faithfully built of rootlets or grasses, or more often twigs and grasses, and in many cases they are artistically arranged. They are seldom above 6 feet from the ground, and placed in all manner of positions, preference being given to perpendicular slight stems, though nearly as often I have found them placed upon the horizontal firm twigs or branchlets of shrubs and bushes. One nest was placed in the socket for a paddock slip-panel, a second in a furze or whin hedge, many in bushes of the same or in *Leptospermum*, others in acacia wattles, and fewer in eucalypts.

That these two species of Wood-Swallow visited the south in considerable numbers may be deduced from the fact that 40 nests—building, tenanted, and vacated—were observed by the writer on the 16th December within a mile's walk, and nearly within a narrow straight line. Two orchards, a belt of furze or whin, and an almost dry watercourse had to be passed by. Within a given area the nests were placed in the orchards more numerously than in the legume whin. Plum, pear, apple, and cherry trees in particular received the nesting honours. One nest was placed 2 feet above the ground in a sweetbriar in the township of Surrey Hills. My chord of generosity was somehow struck, so I placed a piece of basalt in the nest in order that the birds would be saved more serious disaster later on. Next week the nest was gone, and a like fate would have awaited the eggs but for the kindly intervention which caused the birds to build elsewhere.

Both the male and female birds appear to sit.

Generally this bird might be regarded as most sensitive to outside interference. Yet in isolated instances it possesses a wonderful hardihood and persistence in following out an idea,

as the following instance shows:—On the side of a certain road a pair of Wood-Swallows had built their nest in a young elm tree enclosed in a tree-guard. This nest was removed bodily in order to prevent such damage to the tree as might arise from the investigations of curious boys. Undeterred by this rebuff, the birds again built on the same spot, only to meet with a like fate. For no less than seven times did they persist in their work, evidently convinced that the fork chosen as the site for their home was a desirable one, not to be vacated because of such slight mishaps as the bodily removal of the nest six times in succession—due, probably they thought, to natural causes. After the seventh time, however, they made no further attempt to build on the ill-fated elm, and moved away to pastures new.

Nest.—Similar to preceding species. Several nests may be placed in orchards.

Eggs.—Similar to preceding species, though varying greatly. Obsolete marks of greyish-brown appear as if beneath the surface.

WOOD-SWALLOW,

Artamus sordidus, Lath.

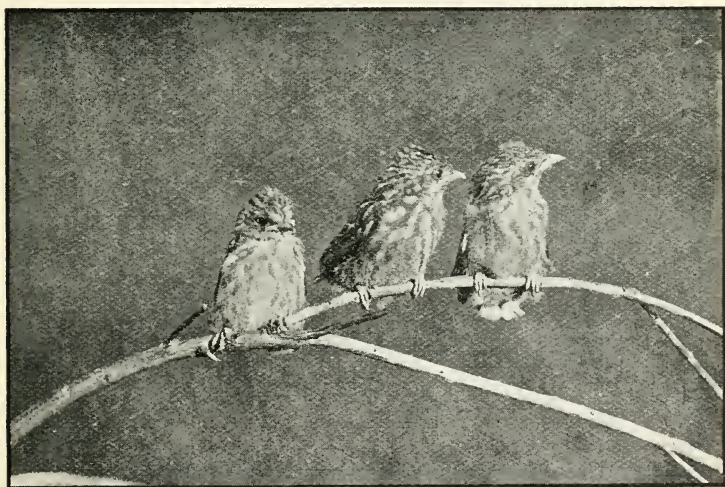
Är'ta-mus sor'did-us.

Artamos, a butcher ; *sordidus*, greyish-brown.

ARTAMUS SORDIDUS, Gould, "Birds of Australia," fol., vol. ii., pl. 27.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7, 9.

KEY TO THE SPECIES.—Under surface of body dull brown; chin scarcely any darker; back and rump brown; two or three quills of wing edged with white; bill long and pointed, the culmen exceeding the length of the hind toe and claw.



Fledglings of Wood-Swallow.

THIS, the most common of the Wood-Swallows, unlike five or six other members of the group who depart to warmer regions in the winter, remains throughout the year in the southern portions of the Commonwealth.

They have a peculiar habit of clinging together in masses from a branch, in which position they resemble nothing so much as an exaggerated swarm of bees.

Artamus sordidus is a particularly pleasing bird as seen on



Wood-Swallow feeding young.

the wing, its graceful soar giving it an air of lightness and charm which cannot fail to attract the observer and bird-lover.

Like the other members, it displays little fear of man—indeed, it seems to regard the latter as its benefactor, in so far as he provides gardens and orchards, which *Artamus* loves to haunt in search of insect life. Displaying every confidence



White-rumped Wood-Swallow. Young and adults.

in the protecting hand over it, the bird will approach quite closely to pick up the insects disturbed by the movements of the gardener among his fruit trees and vegetables. It thus renders an invaluable service to human kind.

Artamus shows no partiality for any particular kind of timber in which to place its nest, building in all kinds indiscriminately. In disposition they are very gentle. The nesting season lasts from September to December.

The largest and the most beautiful form of Artamus is found along the Murray River. It has a white rump and abdomen, and is known as the White-rumped Wood-Swallow (*Artamus leucogaster*, Valenc.)



Eggs of White-rumped Wood-Swallow in old nest of Magpie-Lark.

Nest.—Very similar to the preceding two species. The bird shows a preference for spouts of trees, at the ends of which the slight nests are placed, but the position in the timber may vary greatly. The figure on p. 38 cost Mr. Mattingley thirteen

hours of patient watch before it could be photographed. The bird was very sensitive to the close position of the camera. A further illustration shows the nest of the Magpie-Lark with the eggs of the White-rumped Swallow in it. This is commonly seen.

Eggs.—Three or four for a sitting. They vary in markings considerably. The ground colour is usually dull white, but very often nearly pure white, and always marked with blackish spots, particularly to form a zone near the broader end. Length, 0.9 inch ; breadth, 0.7 inch.

SPINE-TAILED SWIFT,

***Chaetura caudacuta*, Lath.**

Chae-tu'ra caud-a cu'ta.

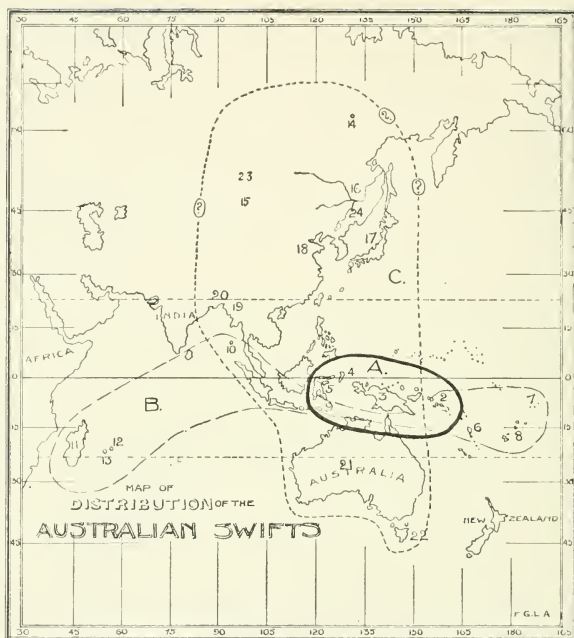
Chaite, mane ; *oura*, tail ; *cauda*, tail ; *acutus*, pointed.

CHAETURA CAUDACUTA, Gould, "Birds of Australia," fol., vol. ii., pl. 10.

GEOGRAPHICAL DISTRIBUTION.—As shown in accompanying map.

KEY TO SPECIES.—Shafts of tail have spinous points ; tarsi as long or longer than middle toe ; chin and throat pure white ; small white band across forehead.

THE Spine-tailed Swift, in common with its near relative, the White-rumped Swift, does not remain throughout the year in Australia. The first-named breeds in Japan, the second in Central Siberia, but each agrees in coming to our shores with their young at the end of the Northern summer. As they arrive in Australia in November and depart in March, it is, doubtless, the abundant insect life of our summer which attracts them.



Map showing Distribution of the Australian Swifts.

- A.—*Edible-nest Swift*—1, North Queensland; 2, Solomon Islands; 3, New Guinea; 4, Moluccas Islands; 5, Celebes Islands.
- B.—*Grey-rumped Swiftlet*—1, North Queensland; 2, Solomon Islands; 6, Fiji Islands; 7, Samoa; 8, Friendly Islands; 9, Malay Archipelago; 10, Andaman Islands; 11, Madagascar; 12, Mauritius; 13, Bourbon.
- C.—(c') *White-rumped Swift*—14, Yakutsk; 15, N.W. Mongolia; 16, Amoor River; 17, Japan; 18, China (Cheefoo and Taikow); 19, West Burma; 20, India (Assam and Cachar); 21, Australia in general; 22, Tasmania.
- (c'') *Spine-tailed Swift*—23, Irkutsk; 16, Amoor River; 24, Ussuri; 17, Japan; 18, China; 21, Australia; 22, Tasmania. Twice reported as wandering to Great Britain.

Migration may be complete, partial, or accidental. In the case of the Swifts, which pass through the summers of both hemispheres, it is complete. The Welcome Swallow, journeying annually between Queensland and Tasmania on the eastern side, offers a good example of partial migration; whilst the European Shoveller Duck, which wanders to our continent occasionally, presents a case of accidental migration.

It was generally believed by people living in the time of Gilbert White, of Selborne, that Swifts and Swallows buried themselves away in ponds and mud pools during the winter, which they passed in a state of torpor, from which they were awakened by the advent of spring. It was discovered later by observers that they wandered to other lands, attracted thereto by the abundant food of summer. Finally lines of flight across certain countries were mapped out. For generation after generation, extending probably through thousands of years, these paths had been followed by the migrating birds, who, guided by old travellers or by an unerring instinct, deviated little from the line, excepting under stress of weather.

SCARLET-BREASTED ROBIN

(RED-BREAST),

***Petroeca leggii*, Sharpe.**

Pet-re'ka legg'ē-ē.

Petron, a rock ; *oikos*, a family ; *Legge*, a proper name.

PETROICA MULTICOLOR, Gould, "Birds of Australia," fol., vol. iii., pl. 3.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6.

KEY TO THE SPECIES.—Upper surface black ; white frontal mark very large ; throat black ; breast scarlet.

Female.—Throat and back grey ; a flush of red on breast.

THERE are seven species of so-called Red-breasted Robins in Australia, the shade of red which gives the birds their vernacular name varying considerably in the different species. Thus some are scarlet-, others pink-, rose-, or flame-breasted, accorded to the tint affected by the bird.

While the "red-cap" shows a decided preference for the dry timber, the "flame-breast" prefers the moist timbered lands. The wildest hills of New South Wales and Victoria are the haunts of the Pink-breasted and the Rose-breasted species.

The "flame-breast" and the "scarlet-breast" are the birds that visit the outskirts of the towns in autumn and winter. They enliven us with their sweet, though hard, notes, and beautify the fields while they stay. Where they go in spring and summer was at one time as great a mystery as where the Pelican lays its eggs, but now we know they simply retire to the forests to nest. The "flame-breast" goes away earlier and deeper into the woods than the "scarlet-breast." Comparing this gorgeous bird with the conspicuous Blue Wren, it is interesting to note that the male Robin retains its colour throughout the year, while the Wren moults its blue, and goes through the winter in a modest brown dress, and only with

the advent of spring dons its brilliant blue again. It takes a Robin at least three years to develop a thoroughly brilliant red.

A beautiful sight may be seen by the wanderer through our paddocks on a bright winter day in July; he often comes across a company of 30 to 40 male Robins flitting about from fence to bush, or starting from the ground as he approaches. To witness such a sight is one of the many joys which face the lot of the enthusiastic ornithologist. The breeding season lasts from August to December, two or three broods being reared each season.

The male "flame-breast" (*P. phænicea*) essays a little musical performance in the early spring, as though to announce the passing of the cold, and call forth the dormant life of the earth. How welcome these notes are at this time to the expectant farmer!

The song of this bird is a set bar containing about seven notes, very sweet and varied, and occupying perhaps two and a half seconds in production. Early bird-voices, like that of the "flame-breast," because of their rarity, are particularly amenable to study, for the full burst of song that fills our woods later, in the incoming spring, raise a complete medley, delightful yet somewhat confusing. The males then appear to vie with one another in producing the loudest notes.

The throat of the Flame-breasted Robin is red; that of the Scarlet-breasted, black.

Nest.—Cup-shaped; neatly and compactly made of bark, ornamented exteriorly with mosses and lichens, and lined interiorly with dry grasses, feathers, &c. It is placed on a horizontal branch, but may be put in a fork near the ground.

Eggs.—Three or four for a sitting. Ground colour pale green or creamy-white, both spotted with greyish, blue-grey, and brown. Length, 0.75 inch; breadth, 0.6 inch.

RED-CAPPED ROBIN, *Petroeca goodenovii*, Vig. and Hors.

Pet-ré'ka gud-ē-nō'vê-ē.

Petron, a rock ; *oikos*, a family ; *Goodenough*, a proper name.

PETROICA GOODENOVII, Gould, "Birds of Australia," fol., vol. iii.,
pl. 5.

GEOGRAPHICAL DISTRIBUTION. — Areas 6, 7, 9; occasionally 4 in
autumn.

KEY TO THE SPECIES.—*Male*.—Forehead red; throat black.

Female.—Body greyish; forehead faintly marked with red; no
red in young; bill about equal in height and breadth at the
nostrils.

IN the Eastern part of the Commonwealth this beautiful and sprightly species is known as the Mallee Robin, although other Robins, such as the Black and White Robin and the Scrub-Robin, without red breasts, inhabit the same areas. This last species (*Drymacædus brunneopygius*) belongs to another genus, and it differs more from *Petroeca* than the latter does from *Saxicola*, the British Robin.

The Red-capped Robin, after satisfying its vanity by a show of brilliant colour in the open country during the winter, retires to the depths of the bush early in spring, where it builds a compact, cup-like nest in which to rear its young. The time occupied in the building of this structure varies with the circumstances, 12 to 15 days being about the average duration. The completed nest is an elegant home of messmate bark, highly decorated externally with mosses and lichen.

The eggs, two in number—three on rare occasions—are laid on successive days, and the time occupied in incubation is 14 days.

My friend, Mr. J. A. Hill, states that the birds have two

broods in a season—the first in August and the second in December. Very young birds are flying about in September, and birds accompany their parents till April. The young males of a previous year nest in the following August, but they are unmatured as regards their plumage, and resemble the hen birds rather than the old males. This early breeding applies also to the Hooded Robin.

Red-cap is specially sensitive to danger, and when any person approaches the nest or young the male feigns a broken wing, and with active legs drags itself along the ground, hoping by this means to draw the intruder away from the seat of anxiety. Mr. Hill, who has had considerable experience with the birds of his district, considers this species the most useful insectivorous bird in the Mallee adjacent to the Murray. I am inclined to think that the first red-breast seen in Australia by a naturalist was perched upon a boulder on a winter's day, hence the name, meaning rock family. Robins are often seen on a stony field, and flit from one rock to another, resting a considerable time on each in the intervals of their flight. The hen birds are not of themselves musical, but apparently enjoy listening to the song of two or three males, who pour forth a short stream of melody delightful even to the human ear.

Nest.—A delicate cup-like structure of the same material as that of the previous species, but more neatly built; very prettily ornamented outside with mosses, and so appears like an excrescence of the bough or fork on which it may be placed.

Eggs.—Generally four to a sitting, sometimes three. Ground colour greenish-grey, with lilac-brown spots, especially around the greatest diameter of the breadth. Length, 0.6 inch; breadth, 0.5 inch.

HOODED ROBIN

(BLACK AND WHITE ROBIN).

***Petræca bicolor*, Vig. and Hors.**

Pet-re'ka bi'kul-or.

Petron, a rock ; *oikos*, a home ; *bi*, two ; *color*, colour.

PETROICA BICOLOR, Gould, "Birds of Australia," fol., vol. iii., pl. 7.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 9.

KEY TO THE SPECIES.—Under surface white ; insertion of wing white ; base of tail white. *Male* has a black throat, the *female* an ashy one. Bill about equal in height and breadth at the nostrils.

Young.—Dark brown above, lighter below ; wings and tail like female.

THE relationship this bird bears to the familiar red-breast is not generally recognized because of the wide difference in colouration. Yet a critical comparison of the two species indicates beyond a doubt their close affinity. The construction of head and bill, disposition of tail and wing feathers, and style of legs and feet are the same in each case ; hence in essentials the two species agree.

The former scientific name applied to the Hooded Robin (*Melanodryas bicolor*, meaning "Black and White Nymph of the Woods"), is very *apropos* so far as external appearances and habits go, for it is a denizen of the light timber, seldom venturing to leave the covert suited to its nature. This name unfortunately led to some misunderstanding, by reason of the presence of another "Nymph" in the north-west of the continent, which differs only slightly from our present subject. The classical name, *Petræca bicolor*, is now registered throughout the scientific world, and by this name only is it correctly known.

The Hooded Robin is an active insect-hunter, darting from bush to bush in search of coleopterous and other insects or their larvæ.

Nest.—Cup-shaped, composed of bark, and lined with fine grasses. It has the general appearance of a Robin's nest, but is not so finely built as those of the other species, and is placed nearer the ground.



Hooded Robin.

Eggs.—Three to a sitting, sometimes two. The ground colour is apple-green without spots, or paler green without spots. Length, 0.75 inch ; breadth, 0.6 inch.

YELLOW-BREASTED SHRIKE-ROBIN

(YELLOW ROBIN),

Eopsaltria australis, Lath.

Ē-op-sal'tri-ū aus-tra'lis.

Eos, dawn ; *psaltria*, a female harper ; *australis*, southern.

EOPSALTRIA AUSTRALIS, Gould, "Birds of Australia," fol., vol. iii., pl. 11.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4.

KEY TO THE SPECIES.—Abdomen bright yellow ; only upper throat whitish ; upper surface greyish ; rump pale yellow ; bill at nostrils broader than high ; culmen, 0.7 inch.

THE home of this strangely-coloured Robin is principally in the most densely timbered lands of the eastern portion of the Commonwealth. In the jarrah country of the western half there is a second species of the genus in which the yellow of the breast is replaced by white (*E. gularis*, White-breasted Shrike-Robin).

The growers of the smaller kinds of fruits scarcely realize the value of this most thorough insect-eater, which renders incalculable service in those orchard lands situated in humid valleys untouched by other species.

The silent, unobtrusive bird, that would not so much as disturb a thought of the naturalist in a glen, will remain for minutes together attached in a perpendicular position to a tree without any apparent movement of muscles or feathers. Suddenly it noiselessly darts at a fly, and as suddenly regains its former position in readiness for a second excursion. One Saturday afternoon I approached a tree, thinking to take off what I considered at the distance to be a new fungus, when,

as I stretched out my hand to seize it, the object became winged, and away flew a Yellow Robin.

The bird will fly from undergrowth to stem of tree, clinging thereto as is the manner of the Tree-creepers, but differing in as far as it does not creep like this bird.

This species is one of the foster-parents of *Cuculus pallidus*, a bird somewhat similar to *C. flabelliformis*. On the 24th November I saw birds in many grades of plumage, juvenile to adult, in this year's brood. The changes are rapid—first, yellow on the neck; second, chest yellow; third, nearly developed yellow, with straggling brown feathers showing irregularly along dorsal surface.

By November the nests become deserted. Although nests are generally placed within a few feet of the ground, I noticed one raised 20 feet above the ground.

It is interesting to note that new nests are sometimes placed 2 feet from those of last year in the same shrub. Whin *Acacia (A. verticillata)* may support them, or a three-pronged perpendicular sapling, or, which is the usual position, a horizontal light branch.

Nest.—Cup-shaped; placed in scrub and near the ground, in a fork or on a limb; made of bark, covered with mosses and shreds of bark, and lined with grasses.

Eggs.—Two or three to a sitting. Ground colour deep or light green, with markings of brownish-red or tawny brown over much of the surface. Some have a zone round the bulged end. Length, 1 inch; breadth, 0.7 inch.

CRESTED SHRIKE-TIT,

Falcunculus frontatus, Lath.

Fal-kung'kū-lus fron-tā'tus.

Falco, falcon, and diminutive suffix, *culus*; *frons*, front.

FALCUNCULUS FRONTATUS, Gould, "Birds of Australia," fol., vol. ii., pl. 79.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

KEY TO THE SPECIES.—*Male*.—Under surface yellow; back olive green; throat black; head crested; secondaries graduated; culmen strongly curved downwards.

Female.—Throat green, and not black as in male.

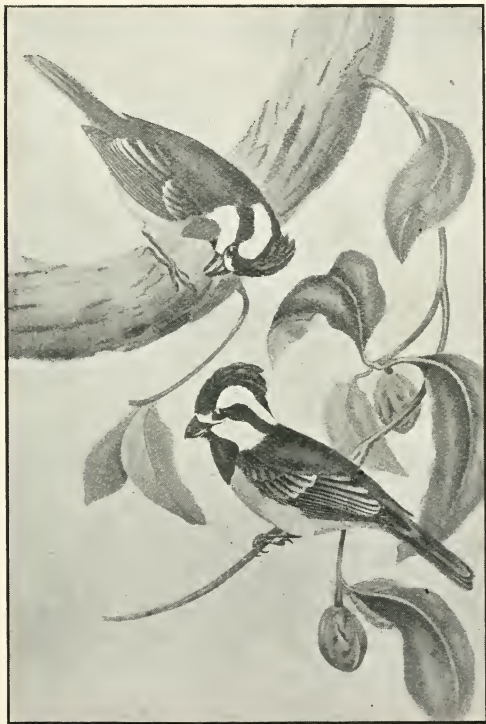
THE eastern and western sides of the continent have each one species of Shrike-Tit, and Central Australia is visited by the eastern bird. It seems to me the birds of the Western State have all travelled from the eastern side—some through the north, others through the south, and many midway.

The western form of this genus has, in the course of time and through the influence of new conditions, become differentiated from the eastern species. It is an active and powerful bird, performing astonishing acrobatic feats amongst the branches it loves to frequent.

It passes the bulk of its time upon the uppermost branches of eucalypti, say 50 feet in height, and therefore keeps in subjection that portion of coleopterous life which is not sought for by most other birds who frequent the lower trees. It checks the fecundity upon the "sky-raking" branches very much as the small Tits do upon the peripheral parts of the lowermost branches. One scours the tops of the aged eucalypti, the other (*Acanthiza lineata*) the bottoms of the young eucalypti.

The bill of the Shrike-Tit is very strong, such an instrument

proving very fatal to that destructive pest, the cockchafer-beetle. The erected crest and animation of the sprightly bird, as it climbs or clings to the branches of the trees, are very characteristic.



White-bellied Shrike-Tit.

The rareness of the species lies more with the nest than its owner. Hidden away on a slender twig on the top of a tall tree, it is not only difficult to find out, but to procure. Two nests, taken in Peppermint Gums (*E. amygdalina*) some

40 feet from the ground, in the consecutive years 1893-4, and in the same paddock, were obtained by a young member of the Surrey Hills Boys' Field Club. I am indebted to him for both these nests, each of which contained three eggs. One was found on the 4th of December, 1894, and the other in the same month of 1893. Had not the sitting bird continued to sing while on the nest, it would not have been observed. The forest occasionally resounds with its mellow call, which is made of two notes, freely used.

Nest.—A truncated sphere, beautifully built of grasses covered with cobweb. It is placed in the three-pronged fork of a slight upward branch on the top of a high eucalypt.

Eggs.—Two or three to a sitting. Dull white, spotted over the greater part of the surface with lilac-grey, portions of which appear as if beneath the surface; spots more numerous at broader end. Length, 1 inch; breadth, 0.7 inch.

SHORT-BILLED TREE-TIT

(SHORT-BILLED SCRUB-TIT),

Smicrornis brevirostris, Gld.

Smī-cror'nis brev-i-ros'tris. *

Smicros, a variety of *micros*—i.e., small; *ornis*, bird; *brevis*, short; *rostrum*, a beak.

SMICRORNIS BREVIROSTRIS, Gould, "Birds of Australia," fol., vol. ii., pl. 103.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 6, 7.

KEY TO THE SPECIES.—Under surface pale yellowish-buff; upper surface dull olive-yellow; lores, eyebrows, and ear coverts light reddish-brown; culmen, $\frac{1}{4}$ -inch in length.

EASTERN Australia has one species of *Smicrornis*, and the western and northern portions of our continent another.

This is one of those little creatures that is only a fraction longer than 3 inches, and for a distinguishing mark, as its name implies, has a short, stumpy bill. Like most of the other Tits it associates in shrubby trees, but, unlike the



Western Fly-Eater.

majority, it passes much time in the high branches of tall timber, clinging in all sorts of positions, now on the upper surface and then below, while it makes a thorough overhaul in search of insects, scales, and "hardwings."

Unlike the rarer bird of similar habits (*Pseudogerygone culicivora*), its voice is not a strong one, resembling more that of the "Yellow-tail." The *Pseudogerygone* has a sweet yet powerful voice, which I have only heard in Western Australia. There it is known as the Western Fly-eater.

The breeding months are September and October, and the young early assume a likeness to their parents, both sexes being much alike.

Nest.—Suspended, side-entranced, pyriform structure, made of grasses, cocoons, and mosses, lined internally with feathers. It is small, and in this respect corresponds with the bird.

Eggs.—Three to a clutch; in colour brownish-buff, spotted at larger end with light brown, sometimes with a zone. Length, 0.6 inch; breadth, 0.45 inch.

YELLOW-RUMPED TIT

(YELLOW-TAIL, TOM-TIT, THORNBILL),

***Acanthiza chrysorrhoa*, Quoy and Gaim.**

A-kan-thi'za kris-or'ho-a.

Akanthis, a linnet; *chrusos*, gold; *orros*, tail.

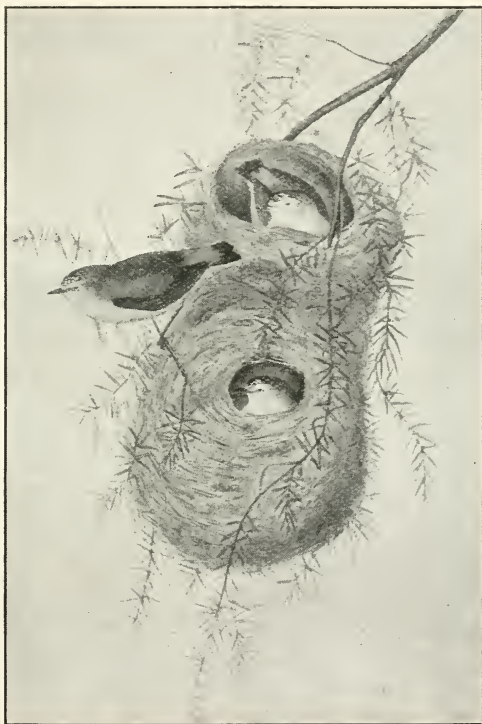
ACANTHIZA CHRYSORRHOA, Gould, "Birds of Australia," fol., vol. iii., pl. 63.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7, 9.

KEY TO THE SPECIES.—Base of tail bright yellow, like upper tail coverts; forehead white-spotted; dark band on tail, occupying nearly terminal half of feathers; tail quite even; tarsus scutellated; first primary narrow and short, half length of secondary primary.

THIS Tit, one of 10 species peculiar to Australia, is the common hedgerow bird of our continent. So affable is its nature that it not only associates peaceably with men and Hawks, but actually builds its two-roomed home against theirs, especially the latter.

Each Tit that owns a house in an orchard is worth more than its weight in gold, so valuable are the services of this insectivorous genus. On no account whatever, except for strictly scientific purposes, should this bird be killed or driven



Yellow-rumped Tit.

from a garden. Especially must we consider that as a worthy labourer it demands nothing for its hire, but expects only to be left in peace. That surely is easily dispensed from the storeroom of our benevolence. Let me give one word of

warning: see that your honest sons are made more honest, if that be possible, by the absolute protection of its nest and eggs. In every way encourage the bird to spend its time about your gardens—not necessarily in them, but around them.

This little Tit, or so-called “Yellow-tail,” to city people the most familiar of country birds, is of small size, and even appears to attract more notice than the Ground-Lark or proper Pipit. The chrome-yellow of the upper tail coverts, with apex of each rectrix barred with black, makes this little grey bird a distinctly prominent one. The markings are only noticeable when the birds, finding themselves disturbed on the feeding ground, rise upon wing, and with blended voices alight in the acacia. They quickly return to the grass, and appear to have little fear of man. With the aid of their tiny feet, the birds move rapidly along the ground in search of insects.

This species puts aside its gregarious habit about July, and enters upon the work of building its nest, a structure that is generally placed within 9 feet, or rarely over 12 feet, from the ground. The house is most often one-chambered, dome shaped, and with cup-like cavity fitted above, to which the non-sitting bird retires when the shades of night have fallen and the daily hunt for food is over.

Occasionally two chambers will be formed, without an upper cavity, one lined with care, the other roughly finished, though no rule can be formulated as to which will receive the eggs. At one time it is the upper, at another the lower chamber. I believe the Cuckoo’s action will often settle the matter, for if the “parasite’s” egg be deposited in one cavity before the rightful owner lays its own, the Tit will deliberately place its eggs in the other, with the result that the Cuckoo’s egg will not be hatched. In the case where a one-chambered nest is utilized by the stranger, the Tit may cover

the introduced egg with a lining of feathers, and so prevent incubation; but this is not generally resorted to, and the strongest chick—the young Cuckoo—becomes the sole surviving member of the group.

At another time the Cuckoo may be “unfortunate” in the deposition of its egg within the cup-shaped cavity of the nest, after which it will naturally remain unhatched. This is of rare occurrence.

One season I observed a double nest built in the whin, both rooms perfect externally, but the lower one, with its entrance facing the bush—an unusual position—finished internally. The whole was new, and the upper one contained an egg of the Narrow-billed Bronze Cuckoo, the lower a clutch of the Tit. The birds appeared to be in excellent plumage, and were probably old enough to remember the disappointment of one or two past seasons, insomuch as related to the hardship of rearing an uncongenial bird. To circumvent the design of the Cuckoo, the second chamber was added to the nest and the original abandoned. As with previous cases the foreign egg remained unhatched, this giving the smaller bird an opportunity to rear its own young. Rarely do small birds add a second nest of this nature.

Mr. G. J. Romanes has noted this inclination in the Common Wren of Europe, and individual cases are elsewhere quoted.

The “Yellow-tailed Tit” of the boys builds its nest not only in hedges, but on the larger branches of various trees, and, as has been previously noted, to the sticks of the lower portion of a Crow’s or Raven’s nest, without any apparent fear of their black neighbours. The parasitical mistletoe (*Loranthus*) is also resorted to, as well as the wattle.

An unusual case came under my notice, in which two clutches of eggs had been placed in one nest, but requiring the attentions of two females in their incubation, as proved by the fact that both fluttered out of the nest on my approach.

The eggs numbered six, and one male bird appeared to be the husband of both the sitters, whom he fed liberally with insects during their enforced detention. How this state of matters would have developed I cannot say, as observations were interrupted by the wilful destruction of the nest by some lawless vandal.

The disposition of this species is certainly a friendly and trusting one. A young neighbour of mine one evening caught a family of this Tit, comprising the parents and three young ones, and transferred them, along with the nest, to a wire-faced box. They were carefully kept and fed for fourteen days, at the conclusion of which they were allowed their freedom. Each evening for three weeks they returned to the box to roost, and doubtless would have continued the custom had not the innocent-looking cat of the house preyed upon the five in the late hours of one night.

In further evidence of the goodnature of this bird I may say that, having extracted the eggs from one nest, I kept them away for nearly twenty minutes, and then replaced them, with the exception of a Cuckoo's egg that had been surreptitiously forced on the tiny birds. The bird, gracefully, though with agitation, returned to its eggs, and, I believe, in due course brought the young out, according to evidence seen on my return to the nest a few weeks later. I know it sat upon the eggs for days after the occurrence.

Nest.—Suspended, side-entranced, and bearing a depression on the head; composed of grasses, bark, and spiders' cocoons, the outside being very roughly finished; feather lining within.

Eggs.—White, sometimes with a few faint pink spots at one end. Three or four make a sitting. Length, 0.67 inch; breadth, 0.5 inch.

BUFF-RUMPED TIT

(BUFF-RUMPED THORNBILL),

Acanthiza reguloides, Vig. and Hors.*A-kan-thi'zä reg-ū-loi'des.*

Akanthis, a linnet; *regulus*, a little king—a small bird so called; *eidos*, like (*regula*, staff; *eidos*, form).

ACANTHIZA REGULOIDES, Diggles, "Ornithology of Australia," pl. 99.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 7.

KEY TO THE SPECIES.—Base of tail pale fulvous-brown; upper tail coverts dull yellow; dark band on tail, occupying nearly terminal half of feathers; tail quite even; tarsus scutellated; first primary narrow and short, half length of second primary. Total length, 4 inches; culmen, $\frac{1}{2}$ -inch; wing, 2 inches; tail, $1\frac{1}{2}$ inches; tarsus, 0.65 inch.

THE nearest ally of *A. chrysorrhoa* is the Buff-rumped Tit. It is easily distinguished from the former by the absence of white markings on the forehead, and the fainter colour of the upper tail coverts. It is numerous and well dispersed over the country lying south-east of an imaginary line drawn between Spencer Gulf and the Fitzroy River, in Queensland.

Both species are popular friends of tillers of the soil, and rarely are they recognized as two species. *A. reguloides*, possessing the same habit of hanging to the twigs of gum-trees, is generally confused with the Striated Acanthiza, and when it is associated with *A. chrysorrhoa* it again appears to be identical with that species. The differences of manner and markings are quite evident when once recognized. Even in the newly-fledged of both species there is no room for a mistake, for the conspicuous markings of the adults are upon

the young before they leave the nest. The best reference plate of this species is to be found in Diggles's "Birds of Australia."

This restless bird has quite a different series of notes from the one previously mentioned, the calls being sharp, high, regular, metallic; moreover, it associates in flocks in the eucalypti, flying quickly and with a less jerky motion than *A. chrysorrhoa*.

The position of the compact and artful nest varies from a bracken, 18 inches from the ground, to a sapling, with occasionally a hedge as an environment. The architecture will only vary in the material, and feathers, where obtainable, will form a favourable inner wall.

One of my friends tells me of four nests observed by himself in a forest, which were built, so far as the main portion was concerned, of sheep's wool and grass, and rabbit's fur for the internal lining. In suburban districts the soft bark of trees is largely used, with feathers for lining.

The eggs are laid on each alternate day, three being the usual number for a sitting—rarely four.

The time of incubation occupies 18 days, and the time from the breaking of the shell to the departure from the nest 19 or 20 days. The young are very vigorous, and almost equal their parents in the strength of their first flight.

Mr. Geo. Graham has written to me of a fact showing evident persistence on the part of a pair of birds to rear a family. The first brood was breakfasted on by a fox. The second clutch of three eggs did not hatch out on the sixteenth day of sitting, so a third clutch of equal number was placed above these, some lining material having first been placed over the infertile eggs. These hatched out on the eighteenth day from the laying of last egg.

Nest.—Dome-shaped, side entrance; suspended in growing bracken fern or grass, or in the loose bark of the trunk of a

large gum. It is made of bark and grass, and lined with feathers or any other soft material available.

Eggs.—Three or four to a sitting; white, faintly spotted at the larger end with pale reddish-brown and purplish-brown. Length, 0.6 inch; breadth, 0.45 inch.

BROWN TIT

(SCRUB THORNBILL),

***Acanthiza pusilla*, Lath.**

A-kan-thi'zä pū-sil'ä.

Akanthis, a linnet; *pusillus*, very small.

ACANTHIZA PUSILLA, Gould, "Birds of Australia," fol., vol. iii., pl. 53.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4.

KEY TO THE SPECIES.—General appearance light olive-greenish; band on tail subterminal; throat ashy-white; head like back, except scaly feathers on forehead; throat and breast perceptibly streaked with dusky black; upper tail coverts reddish, contrasting with upper parts of body; no white tips to tail feathers; forehead pale rufous, with dusky brown tips to feathers; flanks light fulvous brown. Wing, 2 inches; tail, 1.75 inches.

THE little Brown Tit is a bird one will often find located in the Melaleuca.

Although it is very small, and difficult of observation in the thick foliage of creek or upland timber, its pleasant and varied voice will help one to trace its whereabouts. The notes are liquid and musical, variously pitched and extensive; heard to advantage only when one is near, for its mellow voice is not strong enough to penetrate beyond the distance of a few yards.

In a single observation communicated to me the time occupied in laying three eggs was six days; thus each egg was

deposited on alternate days. The young remained in the nest eighteen days, which is a longer time than is usual with small birds.

From five nests of this species, known to myself, a fox extracted the young birds. Indeed, the fox bids fair to do a lot of damage to our avifauna, for even the Laughing Jackass suffers at its hands, the young often being snatched from low stumps.

Nest.—Dome-shaped, and suspended in grasses or near the ground. In appearance it is like that of the preceding species, with a slight funnel or overmantel to the entrance. Length, nearly 4 inches, slightly narrower than long.

Eggs.—Three to the clutch, similar to that of the preceding species, and generally bearing a zone on the broadest portion. The eggs of young birds may be quite spotless.

LITTLE TIT

(YELLOW TIT, YELLOW-BREASTED THORNBILL),

***Acanthiza nana*, Vig. and Hors.**

A-kan-thi'zä nā'na.

Akanthis, a linnet; *nanus*, dwarf.

ACANTHIZA NANA, Gould, "Birds of Australia," fol., vol. iii., pl. 60.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6.

KEY TO THE SPECIES.—Upper surface uniform olive-green; under surface pale yellow; throat rufescent, streaked with whitish shaft lines; band on tail strictly subterminal; tail quite even; tarsus scutellated.

FROM its close general resemblance to the other *Acanthizæ* the Little Tit is difficult to distinguish from other members of the group when seen amid its natural surroundings.

It has a note slightly different from the others, and is most numerous in the Mallee country of the east.

Practically it performs that service in the dry areas that *A. pusilla* does in the moist parts. During winter it travels long distances, and on more than one occasion I have been surprised to find it south of county Evelyn, Victoria, late in the autumn.

Nest.—Dome-shaped and roughly formed; side entrance near top, without a mantle. It is suspended from foliage on various shrubs in the scrub. In many respects it is similar to those of the two previous Tits.

Eggs.—Three, sometimes four, to a sitting; white, blotched with reddish and lilac spots, particularly on the bulged portion. Length, 0.65 inch; breadth, 0.45 inch.

STRIATED TIT

(HANGING TIT),

***Acanthiza lineata*, Gld.**

A-kan-thi'zä lîn-e-a'ta.

Akanthis, a linnet; *lineatus*, lined.

ACANTHIZA LINEATA, Gould, "Birds of Australia," fol., vol. iii., pl. 61.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6.

KEY TO THE SPECIES.—Head a little more rufescent brown than the back, and streaked conspicuously with whitish shaft lines; back olive-greenish; throat ashy-white; band on tail strictly subterminal and not equal to basal half of tail; tail quite even; tarsus scutellated.

THE smallest member of the genus is the Striated Tit, peculiar to Tasmania and our continent. Its vernacular name, Hanging Tit, refers to its habit of suspending itself from

leaves at the extremities of the gum branches, through which it scampers in search of food.

The principal feeding ground of this species is on the peripheral parts of eucalypti, and it is well worth noting that it is the special business of this bird to reduce a horde of insect life upon the tips of branches that are visited by very few other birds. Just as a Honey-eater flutters before a richly-laden flower, so does this one before the extreme tips of boughs before hanging upon them to secure what it has seen.



Nest of Striated Tit.

The nest of *A. lineata* is well woven, small in comparison with the unwieldy mass of *G. chrysorrhoea*, made of dry grass, and lined with brown and white hair of the cow. This is the typical form, but the divergence is as great in the material as with other species. The dome form, with side entrance, never varies, so far as my knowledge of the matter allows me to judge.

Only once have I had the opportunity to note the intervals that elapse between the laying of each egg. They were deposited on successive days.

Nest.—Suspended, dome-shaped, and bearing a side entrance near the top, which is arched. It is made of soft bark, grass, with spiders' cocoons to decorate or cement it, and lined with feathers, hair, or any available soft plant tissue.

Eggs.—Three to a clutch; white, with a prominent zone of dull red spots near the broad end. Length, 0.75 inch; breadth, 0.5 inch.

WHITE-SHAFTED FANTAIL,

***Rhipidura albiscapa*, Gld.**

Rhi-pid'u-rä al-bī-scā'pä.

Rhipis, a fan; *oura*, tail; *albus*, white; *scapo*, shaft.

RHIPIDURA ALBISCAPA, Gould, "Birds of Australia," fol., vol. iii., pl. 83.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 9.

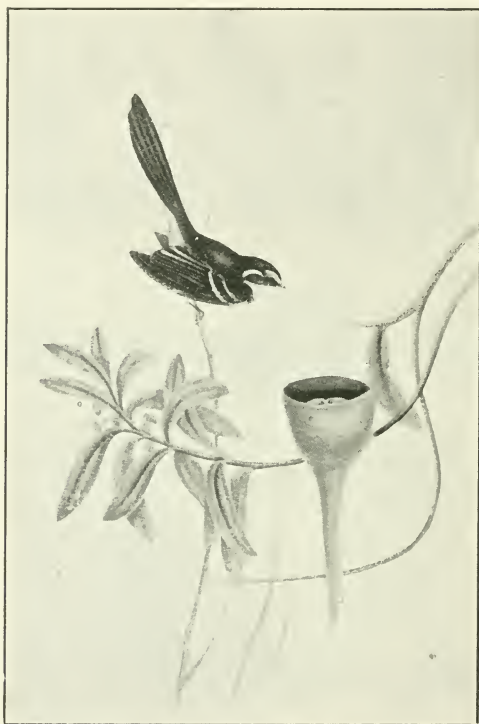
KEY TO THE SPECIES.—Tail longer than wing; the feathers of tail with white shafts except the two centre ones, which are brown; under surface ochreous buff, the breast uniform; throat white, with a black or grey patch on lower portion.

IN the moist parts of Southern Australia this is the most common Fly-catcher.

Almost every creek along whose sides grow tea-tree and other luxuriant vegetation is tenanted by this sprightly little bird, which seldom ventures far from the water. In this latter respect it resembles *R. rufifrons*, but differs in that the latter prefers the mountainous solitudes to the bustle of the creek side in the more open country.

As one rests among the bushes amid which the White-

shafted Fantail loves to make its home, one is astonished by the absolute trust it places in a stranger. Often will it



White-shafted Fantail.

attempt to alight on the field-glasses or gun of the observer, innocent of the probable danger of such action.

The flight of this bird is of a curious wavy nature—that is, from side to side, forming what might be called flight-angles, rather than a straight line. Indeed, it never flies directly to a particular point, but always in a zig-zag fashion.

The call is a single tinny note at times, but at others it will break into an exquisite melody of various notes.

Its nest is very small; therein the young fledglings are crowded to what might well be an uncomfortable extent. A nest containing three nearly fledged young, two inside taking up the whole interior, and the third perched on top, is a truly novel sight.

Nest.—Very small, open, compactly built of grass, densely cloaked externally with cobweb, and the base tapering considerably to resemble the middle portion of a wine-glass. The accompanying plate illustrates it.

Eggs.—Two, three, or even four to a sitting; ground colour creamy-white, with or without a zone of nearly obsolete spots towards the broad apex. Length, 0.6 inch; breadth, 0.5 inch.

RUFIOUS-FRONTED FANTAIL,

***Rhipidura rufifrons*, Lath.**

Rhi-pid'u-rä ruf'-i-frons.

Rhipis, a fan; *oura*, a tail; *rufus*, red; *frons*, forehead.

RHIPIDURA RUFIFRONS, Gould, "Birds of Australia," fol., vol. ii., pl. 84.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6.

KEY TO THE SPECIES.—Frontal plumes, eyebrows, and bases of central tail feathers rufous for nearly two-thirds their length; fore-neck scaled in appearance, the feathers black, broadly edged with white; head and neck brown; tail longer than wing.

THIS bird is easily identified, for it is aptly described by its common name, the whole of its front exhibiting a rufous appearance.

Its habitat is among the hills, where an ample water supply is available throughout the year.

In summer the birds leave their usual haunts and wander long distances through the underwood in the vicinity of a creek, or even into the neighbouring towns.

Whilst at lunch in a restaurant in the city of Melbourne, on 1st March, 1899, I noticed a member of this species enter the lunch room and fly about from picture to picture, amongst the lighter ornaments, and up to and along the ceiling, taking up a fly here and there, of which, to say the least, there was a plentiful supply in the room.

At this time of the year these birds seem to go on voyages of discovery, for on the same morning I saw one near the shipping wharves at Williamstown, and heard of a second at Ascot Vale.

Fresh from the country, they possess a brilliant coat of golden yellow, spruce and shining, compelling the admiration of all observers; in a week's time the carbonized dust changes this brilliancy into a more sober, dull tint. The Sparrows will chirp on as usual, used as they are to the disabilities of city life, whilst these poor wanderers will probably reach the Fitzroy Gardens, and there pass their lives in a semi-civilized manner.

These birds, strange to the city, arrive by following the little creeklets until they strike the beaches, and then along the beaches, following every little clump of private garden trees, till they are landed in the city proper.

Occupying similar country we have two species that are much rarer, *Myiagra rubecula*, Lath., Leaden Fly-catcher, and *M. nitida*, Gld., Satin Fly-catcher, while a third is comparatively even more rare, the Spectacled Fly-catcher, *Piezorhynchus gouldi*, Gld. This latter is seen only in the extreme east.

Nest.—Similar to *R. albiscapa*, described above, and, judging by one specimen alone, it is a little larger.

Eggs.—Two or three to a clutch; ground colour cream; the faint spots form a zone of pale brown and lilac-brown. Length, 0.75 inch; breadth, 0.55 inch.

BLACK AND WHITE FANTAIL

(SHEPHERD'S COMPANION, WILLIE WAGTAIL),

***Rhipidura tricolor*, Vieill.**

Rhi-pid'u-ra tri'kul-or.

Rhipis, a fan; *oura*, tail; *tri*, triple; *color*, colour.

RHIPIDURA MOTACILLOIDES, Gould, "Birds of Australia," fol., vol. ii., pl. 86.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 7, 8, 9.

KEY TO THE SPECIES.—Upper surface and throat jet black; abdomen white; tail larger than wing; rectal bristles present.

THIS is, perhaps, the commonest of Fantails. Wherever you go, across plains scantily timbered and fairly watered, or along well-watered country, you will be sure to meet this species. The preference shown is for the drier rather than for the wetter country, for while the Rufous-fronted species keeps principally to the mountains, and the White-shafted within fairly well timbered land, the Black and White Fantail is a companion of the sheep and their shepherd in grazing districts.

The natives of south-western Australia tell me the bird is known to them as Chid-e Chid-e—an imitation of its notes—while other notes convey to us an expression like "Sweet pretty creature."

It is one of the few birds that sing, or attempt to do so, during the night. The mate of the sitting bird considers it a

duty to periodically whistle through the dark hours, and many a time, while camped for the night, I have heard the single bar of notes resounding through all the hours up to 3 a.m.



Black and White Fantail.

Its flight is made of zig-zag movements, very low and of short duration.

To secure food it is very fond of accompanying animals, and one reason for seeing it near the head of a cow or horse

seems to be a desire to get the insects that are attracted by the warm air expelled through the animal's nostrils.

It is fond of the ground, and makes a pretty picture wherever it may be.

Nest.—Very compactly built of grass, covered densely with spiders' webs, and taking the form of a shallow cup; the



Nest and Eggs of Black and White Fantail.

inner lining is of roots or finer grasses. The position varies with the nature of the tree or shrub. The figure above shows it in a *Polygonum* bush.

Eggs.—Three or four to a sitting; dull yellowish-white, with a zone of dark grey and blue-black. Length, 0.75 inch; breadth, 0.55 inch.

RESTLESS FLY-CATCHER

(SCISSORS GRINDER),

Sisura inquieta. Lath.

Sī-sū'rā in-qui-é'ta.

Seicin, to shake; *oura*, tail; *inquietus*, restless.

SEISURA INQUIETA, Gould, "Birds of Australia," fol., vol. ii., pl. 87.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—Under surface white, no black on throat; at times a rufous tint on breast; upper surface shining bluish-black. Wing, 4 inches; tail, 3 inches.

THERE are generally to be found two "Black and White Fan-tails" associated in the same district, the only point of physical difference being that one has a black throat and the other a white one. Beyond this, the question of vocal differences comes in for consideration.

While this species has a scraping note, which gives it the name of "Scissors Grinder," *Rhipidura tricolor* has a series of notes like "Sweet pretty creature" uttered at lengthened periods. There are also other calls, which may be heard principally in the spring season, and in the stronghold of its *habitat*.

Mr. Gilbert speaks of its vocal powers in the following way:—"The general note is a loud, harsh cry, several times repeated. It also utters a loud, clear whistle, but its most singular note is that from which it has obtained its colonial name, and which is only emitted while the bird is in a hovering position at a few feet above the ground. This noise so exactly resembles a grinder at work that a person, unaware of its being produced by a bird, might easily be misled. Its mode of flight is one of the most graceful and easy imaginable; it rarely mounts high in flying from tree to tree, but moves horizontally, with its tail but little spread,

and with a very slight motion of the wings. It is during this kind of flight that it utters the harsh note above mentioned, the grinding note being only emitted during the graceful hovering motion. The object of this appears to be to attract the notice of the insects beneath, for it invariably terminates in the bird descending to the ground, picking up something, flying into a tree close by, and uttering its shrill and distinct whistle."

Nest.—In many respects it is like that of the last described (*R. tricolor*), differing principally in so far as less cobweb is used to encircle it. Cup-like and rounded; diameter, 2.5 inches.

Eggs.—Clutch, two to three eggs; dull white, marked by spots of reddish and lilac drab, the latter as if beneath the surface; much bulged in appearance. Length, 0.85 inch; breadth, 0.7 inch.

BROWN FLY-CATCHER

(STUMP-BIRD, PETER-PETER),

***Microeca fascians*, Lath.**

Mi-kre'kä fas'i-nans.

Mikros, small; *oikos*, house; *fascino*, to charm.

MICRÆCA MACROPTERA, Gould, "Birds of Australia," fol., vol. ii., pl. 93.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

KEY TO THE SPECIES.—General appearance brown; abdomen and under tail coverts white; outer tail feathers entirely pure white; axillaries light brown; wings very long ($3\frac{1}{2}$ inches); distance between wing and tip of tail not exceeding length of tarsus; bristles at rictus.

If you watch this bird for a few minutes you will unmistakably say it is a fly-catcher, and you are not likely to confuse

it with another well-known brownish fly-catcher (*Rhipidura albiscapa*), because its tail is much shorter than that of the latter.

If it is one of the least ornamental birds in Australia, it has



Brown Fly-catcher.

some compensations. The graceful actions and pleasing voice make up for much that is absent, not to mention its charmingly small house, through which it has probably received its classical name.

The method of hunting for food adopted by these birds is a thorough one.

A given area is apparently marked out, easily surveyed from a position which a pair of birds takes up on suitable tree stumps. Passing insects thus run little chance of escaping the vigilant watchers, who, ever alert, dart out as the doomed prey approaches, capture it, and then return to the same stump in readiness for a second attack. This is done several times in succession, the birds meanwhile affecting (as they do all day) a lateral movement of the tail like a cat which is about to pounce on some luckless sparrow or mouse.

They also forage among the foliage in suitable weather.

Both sexes are gentle, and exhibit little fear of man. It is often a matter of some difficulty to remove a sitting bird, forcible ejection only answering in many cases.

The fascinating ways and the opportunity to note them and their nesting habits are so readily secured that the observer is drawn to watch them, and becomes interested at the same time in the nests.

One I found built near a roadside was so prettily ornamented on that side, the one to view, that I feel inclined to maintain it possesses a sense of beauty. Passers-by could easily observe the special uniform bark-lamellæ, whereas the other side, away from view, was devoid of taste and uniformity.

If the eggs be extracted from a nest and not returned, the owner will destroy the nest, and with the same material rebuild in another spot near at hand.

Although two eggs form the usual clutch, on three occasions I have noted four in a single nest, and in one case, in the year 1895, as late as 26th February. It was in a Cleopatra apple tree, and situated 4 feet from ploughed ground. October is the regular month for building.

Nest.—Open, rounded, shallow, and very small; made of dry grasses, and ornamented very often by bark-lamellæ. It is placed in a small horizontal fork, generally 6 to 10 feet from the ground. Diameter, 2 inches.

Eggs.—Two, sometimes three, or rarely four. There is much colour variation, but mostly dull green, with reddish and lilac spots that have brown in them to blend the whole. Length, 0.75 inch; breadth, 0.6 inch.

BLUE WREN

(SUPERB WARBLER),

† **Malurus cyaneus, Ellis.**

Ma-lur'us si-an'e-us.

Malurus (?); *cyaneus*, dark blue.

MALURUS CYANEUS, Gould, "Birds of Australia," fol., vol. iii., pl. 18.

GEOGRAPHICAL DISTRIBUTION.—Areas, 3, 4, 6.

KEY TO THE SPECIES.—*Adult male*—In summer nearly blue; throat blue-black; upper tail coverts black; ear coverts and mantle turquoise-blue; tail longer than wing; bill about equal in height and breadth.

Adult female—Sombre plumage; chestnutty bill and lores.

Young—Similar to female in the early phase.

THE genus *Malurus* is peculiar to the Australian continent, and no less than sixteen species are distributed through its various areas.

These can be roughly divided into two groups, the red-backed and the black-backed, two others, however, adding a third sub-variety, in that they have a part of the wings and back white.

† According to priority of naming this species should be *M. superbus*, Shaw.

As *M. cyaneus*, the common Blue Wren of Victoria, South Australia, and New South Wales, and *M. gouldi* are representatives of a very important section of destructive insect eaters, I will give to them an extended notice.



Blue Wren.

For at least some months of the year *M. cyaneus* is gregarious—that is to say, associates in small companies, keeping within their individual family circles, or perhaps one circle will join with another similar group.

From the time the young birds leave the nest till the following spring they stay with their parents, and can be depended upon to be found in or about the same place. As a help towards keeping a family in view it is often possible to note a white patch on one of the parent birds, which thus enables that particular family to be watched.

But if one would view the Wren at home with its children, it is necessary to maintain quietness, for the birds take flight at the slightest alarm. Then is one rewarded by seeing the group, from 6 to 12 birds, travelling along the ground beneath the undergrowth, feeding and chatting as they go. Should the leading bird take to flight, the others will follow in single file, and faithfully keep together, though perhaps the last of the colony may be a little behindhand.

The late Mr. John Gould found a difficulty in attempting to mimic by words their melodious notes. There is first the grand oratorio of the male in spring, when he is leading a charming competitive life, followed, secondly, by the notes of rollicking fun of the summer bird; and, thirdly, the series of thrilling squeaks when the young have ventured on a gambol among the boughs, which would be quite out of place in birds of maturer years.

During nesting time the female will sometimes utter a call as if a tragedy were taking place.

Blue Wrens are occasionally known to sing at midnight, and they may frequently be heard about 9.30 p.m., in company with the Black and White Fantail and the Great Brown Kingfisher (Laughing Jackass).

By July the young birds seem to have acquired the highest attainment in their musical efforts, though young Wrens in captivity do not burst into song so soon as those of the bush.

These birds have wonderful appetites, a quality that should be particularly useful to market gardeners.

I have seen them busily eating the small *Plutella* moths in

the early morning when the dew was still upon the grass. During this process one in a family will usually expand its body feathers and become almost spherical in appearance; another will seem to rest lazily as much upon its tail as upon its feet, while the wings lie limp and disarranged. Under such circumstances the young show no fear, timidity being exhibited, nevertheless, by their experienced parents.

The staple articles of their diet seem to be grasshoppers, hard-winged insects, and larvæ.

The persistent observations of my correspondent and friend, Mr. Geo. Graham, a skilled keeper of Wrens in captivity, has proved that they are capable of disposing of 80 larvæ of the Cockchafer Beetle (*Anoplognathous*) daily for months in succession.

As to food supplied—quantity, preference, &c.—it was noted that from July to the 1st January grubs, with a little finely-chopped meat, bread crumbs, small beetles, and caterpillars, formed the bulk of the food. It generally managed to dispose of 60 grubs, about a dozen small insects, and a small proportion of bread and meat, sufficient to equal the bulk of 100 grubs, as named above, per day.

From 1st January to 1st April grasshoppers formed the staple, varied with March flies and cockroaches. The quantity devoured amounts to about the same as with the grubs—namely, 100 per day—and the immature form of the great green grasshopper is preferred to all other kinds of food given to it.

Moths, March flies, and small winged insects are greedily devoured—in fact, it can stow away four large “blowflies” on a fairly full stomach!

At the commencement of the breeding season the males show the greatest activity and pugnacity; as many as five have been seen engaged in a fierce encounter to determine who should claim a certain female as mate.

Nest-building usually takes place in September, and the house is generally placed within 3 or 4 feet of the ground, occasionally in a thistle, but more often in some small bush.

The period of incubation is 14 days, and the young fly from the nest on the eighth to tenth day, though sometimes remaining to the fourteenth.

The brood of *M. gouldi*, the closely-allied species, is usually three, consisting of one male and two females.

The following notes, though applying definitely to *M. gouldi*, practically pertain also to *M. cyaneus* :—

Mr. Graham observed that more than one adult male will attend a single brood of nestlings. Three nests of young were brought from the forest and placed in three cages, somewhat apart. Each nest had its female, which, in one case, was attended by three males, in the second two, and in the third one, all helping in the task of feeding the young. In the first-mentioned case this was observed before the nest was removed, and was continued for fourteen days after the removal to new quarters, where the feeding was done through the wires.

Considering the large number of female Wrens, it seems probable that young females pass the first year without breeding. Unfortunately, broods of both species suffer much from the depredations of foxes.

M. gouldi is hatched out on the fifteenth day from the time of the laying of the last egg. The eyes open on the sixth day, the wings are feathered and fairly fledged on the seventh to eighth days.

The young birds are short-tailed when first leaving the nest, the feathers rarely exceeding 1 inch in length. At the end of the first month the tail seems to have attained its full length. Young Wrens are then able to catch flies and otherwise provide themselves with food, though they are still fed by the parents for another month or six weeks.

They seem to require teaching as to the manipulation of the bulkier items of their food.

Last summer Mr. Graham watched a mother give a young bird a lesson. The latter was trying to reduce a large caterpillar to a condition fit for swallowing by beating it with the bill. After a few strokes, to show how it should be done, the mother would leave the young bird to finish. Sometimes the object would be picked up and handed over without further treatment, while at other times it would have to be repeated often before the food was finally ready for swallowing. I have observed these actions many times, and on one occasion I spent at least 15 minutes carefully watching the method of procedure.

After leaving the nest, the young Wrens, male and female, are alike in outward appearance till the fifth month, when the first moult takes place. After this the males are distinguished from the females, young or old, by their light blue tails. These remain the outward symbol of their sex till the second moult, in the tenth or eleventh month, when they assume the full plumage of blues and blacks, with a still darker blue tail. The bill also becomes a darker colour, and finally is jet black. It wears this spring and summer suit till the third moult, generally in February or early March, when the change is to grey for a season more or less prolonged.

With the older males there seems to be no regular time for recovering their blues and blacks, as individuals can be found moulting the grey from the middle of April to the end of September.

In August the family is disbanded, the males attacking and driving away the younger members of their sex. The old females do the same with the young females, though at a slightly later period.

Another token of the approach of the breeding season is

the intense pugnacity of the mated males. From the time the young are driven off till long after the next brood is out all trespassing Wrens of either sex are persecuted.

In Mr. Graham's garden a male Wren proved a nuisance. It was impossible to give one of his caged Wrens the benefit of air and shade outside. He was thus obliged to keep it indoors and cover the windows with fine wire-netting, so as to protect the caged bird from the incessant attacks of the free bird. Should he have neglected to close the door whilst looking into the cage to see how the changes of plumage were progressing, the tormentor was sure to fly past his head and hang on to the wire of the cage till driven away. Constant chasing seemed to make no difference. It never missed an opportunity for an attack. Its own nest being situated in a gooseberry bush just opposite the door, it was always ready to enforce what seems to me to be the law, that no Wrens may come within a certain distance of the breeding-place.

In wet districts October is the breeding month. In selecting a site for the nest the female is chiefly concerned with securing a place somewhat removed from other Wrens. Ideal nesting-places are small detached portions of cover situated a short distance from the main cover, and all the better if they contain plenty of tussocky grass.

When the young are old enough to make an outcry if disturbed, the time is opportune to witness a display of pugnacity and courage on the part of the male.

It does not flutter or utter alarm notes like the female, but at the first cry of its young goes silently and swiftly to the attack, with its little body crouched, its wings and tail depressed, and its blue mantle standing out like a ruff. It moves quickly along the twigs, or over the ground after the manner of a mouse, making angry darts at the intruder till the latter retires.

Nest-building occupies the female a part of each of six days,

and evidently she has the whole burden of building, for I have not been able to detect a male assisting in this work. During incubation the female leaves the nest frequently to feed.

The evening of the first day the young leave the nest is an anxious time for the parents. Much calling and persuasion is needed to get the young family to follow to a suitable perching place for the night. When this is at last accomplished, one may, with great caution, get a peep at them all in a row, with an old bird at each end. Low, dense, broad-leaved shrubs, eucalyptus trees, if low, or dense masses of broad-leaved sword-grass are the usual camps chosen.

Young Wrens seem to lose their early notes about the time they have fully acquired the song. July and August are the earliest months in which I have detected the young Wrens practising the song, though to some it may come earlier than to others. Besides the song there are the notes of alarm, harsh and quick, the low note of satisfaction uttered with every peck at an insect, especially when the family has alighted on a good patch; and sometimes, not often, a low, melancholy note uttered at each series of hops. In spring the males sometimes make a continued utterance of what resembles half the usual song.

One use of the song is to keep the family together and acquaint each other of their whereabouts. One may often see a Wren which has been left behind mount the topmost twig of a bush and sing till answered from a distance. Then it will fly off in that direction and rejoin the others.

Gould's Wren is not gregarious, though two or three families may hunt over each other's ground. They never join in a community like the Tits and Chats, but each family keeps, if it can, to its own particular ground, and has its own special camp.

Mr. Graham, in a letter to me, says:—

“In 1898 I wrote to you about three males attending a nest

I had transferred to a cage, and about which I was making notes.

“The spring before (1897) I had noticed a similar case, so, when in August, 1898, I found a pair of males attending one female in a very isolated patch of cover, which could be easily seen, I determined to watch them right through.

“From the first it was evident that one male had the happy possession of the female, and that the other male was tolerated either because it could not, or would not, be driven away. When the female was on the nest the two males were apparently friendly enough, fed, hunted, and camped together.

“One day, when I was watching a Magpie-Lark building its nest, a female Wren (a stranger) came into the tree. Both males at once attacked it. For five minutes their bills were clipping like shears, when the poor little female took flight for the nearest cover, pursued by both of its tormentors.

“When the young were hatched out, on the 28th October, both males fed and attended to them, and right on to the present time (20th June) the partnership continues. This being the third instance of such conduct in three successive seasons leads one to assume it is not an isolated example.

“In June, 1897, I had completed the building of a large heap of logs preparatory to the burning, and I was intently watching the actions of a White-throated Tree-creeper, which, having secured an unusual prize—a meal-worm—was making a long task of killing it. Tree-creepers do not seem as expert at such work as other birds, for a Robin would have finished it in a few seconds.

“There were some Wrens about at the time, and one female, seeming as much interested as I was, twice sidled close up to the Tree-creeper, and was rewarded with a couple of sharp pecks in order to make it mindful of its own business.

“After watching the Tree-creeper for a few moments the Wren made a sudden rush, and fairly frightened the Tree-creeper some inches away from its food. The Wren quickly picked it up and flew away with it. This was clearly a feat of strategy, and happened on the heap of logs.

“My garden male Wren is becoming quite shrewd, for it does not now mistake glass for space. If surprised when I come home, it makes a rush past me through the doorway, the result, I suppose, of its having been caught in the window so often and examined. I have a habit of feeding it and its family on a block by the door, and a few crumbs of cheese are sufficient to bring them to my feet.

“Last March I was using a kerosene tin to pick up windfall apples. Standing it by the door, I very soon saw the garden female Wren come and perch on the edge of the tin and catch sight of a grub on the bottom. But how to get that grub was the trouble! It leaned over and hopped round the edge of the tin many times. It would like to go down and get that grub, but it looked too risky. Happy thought!—it would get down outside and get it. Down it went and hunted all round the tin, and seemed surprised it could not see the grub. Up again to the edge it got to see if it was really there. Yes, there it was; so down it went again and tried to insert its bill beneath the tin. Again it hopped up and feasted on the sight for some little time, and then retired from the grub hunt in despair. Birds are commonly deceived in this way.

“As enemies, the Nankeen Kestrel, during summer, takes numbers of young, while the fox, that terrible bird exterminator, plays havoc in the breeding season. That Wren is lucky which does not have to rear a second brood.

“At what age Wrens start breeding I have no certain knowledge, and the large numbers of Wrens, during spring and summer, which have no other occupation than that of feeding themselves leads me to infer that the females do not

breed during the first year. Male and female, when once mated, remain so until accident or the advent of a stronger or more pugnacious male causes a division.

“With regard to the proportion of males to females in the brood, I have not as yet observed more than one male in a brood of three. My garden Wrens have just had the unusual brood of four, and still only one male; but, to be certain of this point, the families will require further watching.”

The males moult their blues for brown in late summer as a general act, and procure a fresh set in early spring.

Nest.—Dome-shaped; side entrance; made of grasses, lined with feathers. Like all the Wrens (*Maluri*), it places the nest near the ground.

Eggs.—Four or five to a sitting; white, with bright reddish-brown spots upon them, near or far apart, oftentimes forming a zone round the broad portion. Length, 0.65 inch; breadth, 0.5 inch.

EMU-WREN,

***Stipiturus malachurus*, Lath**

Stip-i-tu'rus mal-ā-kū'rus.

Stipes, a trunk; *oura*, tail; *malakos*, soft; *oura*, tail.

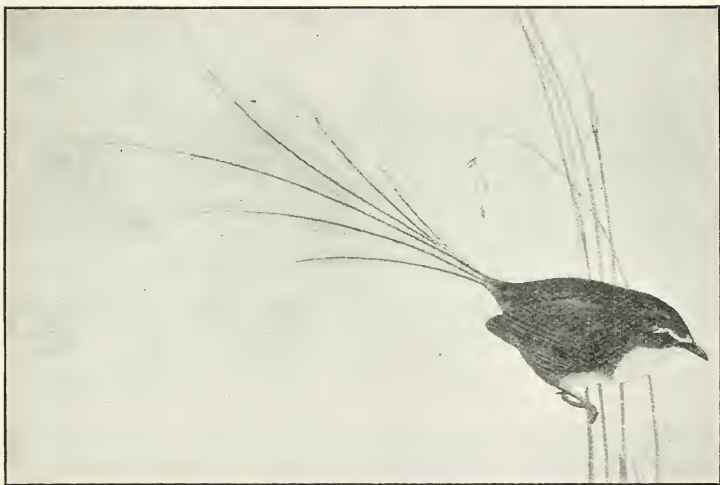
STIPITURUS MALACHURUS, Gould, “Birds of Australia,” fol., vol. iii., pl. 31.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 5, 9.

KEY TO THE SPECIES.—Tail of emu-like feathers; head light rufous, broadly striped with black towards the nape. Male has throat light blue, female rufous. Tail, $4\frac{1}{2}$ inches; total length, $6\frac{1}{4}$ inches.

THIS tiny bird, with a body only $1\frac{3}{4}$ inches long, is fairly plentiful in the swampy lands in which a feature of the vegetation is the rankest grass.

It trusts more to creeping and running among the bushes than to flying. As a matter of fact, its wings are ill-adapted for flight. A visit to the class of land it inhabits will at once reveal the fact that it must be half its time unable to fly, owing to the saturated state of the leaves damping its plumage to such an extent that such a course is fraught with difficulty.



Emu-Wren.

Its voice is a make-up of notes that resemble a twitter rather than a song, and is not to be compared to that of the Blue Wren in quality.

The breeding months are September and October; evidently the birds do not exceed the period comprised in these two months, as no eggs are found later in the season. Certainly they are rare at any time.

In this group are other genera. The Grass-Wrens (*Amytis*

textilis and *A. striata*) are occasionally found in the hot inland country, occupying dry, rank grasses. *Megalurus* (Grass-bird) is a common denizen of the swamps. Possibly the rarest of all this group is the Rock-Warbler (*Origma*).

With the advance of civilization the Emu-Wrens are finding their swamps reclaimed, and, in consequence, are being driven further back and reduced in numbers. Mr. Howitt tells us "the men of the Kurnai tribe used to regard the Emu-Wrens as their brothers, and the women of the tribe the Blue Wrens as their sisters." The black brother and sister have almost gone, the brown brother has his days numbered, but the blue sister will remain while a rural aspect exists.

Nest.—Dome-shaped, and made of grass. It is much more compact than that of the Blue Wren (*M. cyaneus*); better finished and more artfully concealed in the grass and scrub.

Eggs.—Three to a sitting; similar to those of *M. cyaneus*, described above, but much smaller. Length, $6\frac{1}{2}$ lines; breadth, $4\frac{1}{2}$ lines.—Ramsay, *Ibis* (1863).

BLACK-FACED CUCKOO-SHRIKE

(BLUE JAY, BLUE PIGEON),

Graucalus melanops, Gld.

Grá'ka-lus mel'-a-nops.

Graucalus, a perversion of *graculus*, a jackdaw; *melas*, black; *ops*, a face.

GRAUCALUS MELANOPS, Gould, "Birds of Australia," fol., vol. ii., pl. 55.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 8, 9.

KEY TO THE SPECIES.—*Adult*—Upper surface grey; throat, sides of face, feathers round eye, and forehead black; fore-neck and breast grey, shading into white on abdomen and under tail coverts. Bill broad, measured at gape equals outer toe without claw; culmen, 1 inch.

Young—Throat and forehead grey.

THE graceful wave-like flight of this species will always attract our eyes when the bird is upon the wing, or, if at rest, the composed posture and quiet chatter of one or more of the family are sure to interest us.

Upon their return, in September, from the migratory tour, the flock plays very much among the trees, passing from one to another with the gentlest of manners, till the party breaks up for the purpose of nest-building, and, possibly, more serious thoughts.

The birds then become sedately quiet, and one will remain upon a branch for hours, while its sitting mate is upon the nest. In the heat of the day the *Graucalus* always rests amongst the foliage.

The notes of the bird are similar to those of the Oriole, neither of which are describable, unless, as Gould has it, "a peculiar purring or jarring sound, uttered several times in succession, and, as a whole, given at long intervals."

The vernacular name is rendered, I venture to state, because of its likeness on one side to the Cuckoo in flight, and on the other side to the Shrike in bill.

The food of the bird is very varied—insects, their larvæ, ants, &c. From the stomach of one I extracted more than



Black-faced Cuckoo-Shrike.

100 ants, similar to the “sugar” kind, popularly known as the stingless section; among them were two large specimens of the *Coccinellidæ*.

In referring to this species, that celebrated naturalist, the late Mr. Gould, says:—

“When the young, which are generally two in number, leave the nest, the feathers of the body are brown, margined with light grey. This colouring is soon exchanged for one of a uniform grey, except on the lower parts of the abdomen and under tail coverts, which are white, and a mark of black which surrounds the eye and spreads over the ears. The throat and forehead in this shape are lighter than the remainder of the plumage, which is somewhat singular, as in the next change that takes place those parts become a jet black. This colour, I believe, is never afterwards thrown off, but remains a characteristic of the adult shape of both sexes. The infinite changes of plumage which some of the Australian members of this genus undergo from youth to maturity render their investigation very perplexing. I have done my best to define them correctly; if I have committed some errors let us hope that a son of the great southern land may be imbued with a sufficient love for natural science to pay attention to the subject and place it in a truer light.”

A second numerous species is the Little Cuckoo-Shrike.

Nest.—Small, flat, and closely fitted to the fork of a horizontal bough. It is made of grasses, and externally covered with cobwebs to make the nest resemble the grey surroundings. So artfully is this done that one needs to see the bird fly away to discover the nest for the first time.

Eggs.—Three, sometimes two, to a sitting; ground colour dull olive, with chestnut-brown spots boldly appearing on the surface, and dull lilac-red spots as if beneath the surface. Length, 1.25 inches; breadth, 0.9 inch.

LITTLE CUCKOO-SHRIKE

(VARIED GRAUCALUS),

Graucalus mentalis, Vig. and Hors.

Grá'ka-lus men-ta'lis.

Graucalus, a perversion of *graculus*, a jackdaw; *mentalis*, of the chin.

GRAUCALUS MENTALIS, Gould, "Birds of Australia," fol., vol. ii., pl. 56.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6.

KEY TO THE SPECIES.—*Adult* — General appearance greyish-white; throat and breast grey; lower part of abdomen and under tail coverts pure white; thighs slaty-grey; hinder rim of eyelid white; bill broad.

Young—During the first few months the throat, chest, and back of neck are jet black; the white chest and abdomen are rayed with obscure arrow-shaped markings on a white ground.

IN size this bird is smaller than *G. melanops*; in habits it is much the same.

The species has an extensive range through the continent, and is not by any means an uncommon bird.

As an insectivorous member it is a most useful bird, keeping in subjection those species of harmful insects that would, without such help, become too numerous. Occasionally it will give trouble when the fruit is ripening. Considering, however, the distinct service it renders as an insectivorous bird during the greater part of the year, and the short period in which it troubles the orchardist, this little falling away in its habits should not be placed to the discredit of the species.

It nests in the months of October, November, and December.

Nest.—In all respects like that of the previous species. Large eucalypt trees are chosen where possible, though a nest is occasionally placed in smaller trees, as the banksia.

Eggs.—Three to a clutch; ground colour heavy green, with spots of violet-grey, appearing fainter than some reddish spots. Length, 1.25 inches; breadth, 0.75 inch.

WHITE-SHOULDERED CATER- PILLAR-EATER

(WHITE-SHOULDERED CAMPEPHAGA),

Lalage tricolor, Swains.

Lal'-ā-jē tri'kul-or.

Lalage, prattle; *tri*, triple; *color*, colour.

CAMPEPHAGA HUMERALIS, Gould, "Birds of Australia," fol., vol. ii.,
pl. 63.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 6, 7, 8, 9.

KEY TO THE SPECIES.—*Male*—Under surface, under wing coverts, under tail coverts, and ear coverts white; upper wing coverts pure white; upper surface black; tail feathers black; outermost two with white tips.

Female—Brown above, white edges to rump and tail; cheeks and throat whitish; buff edges to wing coverts; under surface yellowish, with obscure cross markings; under tail coverts white; wing 5 inches in length, tail 4 inches.

THERE is a general resemblance between the male of this species and the male of the Hooded Robin. The *Campephaga* (*i.e.*, eater of caterpillars) is slimmer, longer in the body, and more energetic, though not so graceful in its movements. It is migratory, appearing in the south during September and leaving for the north in February. The notes are loud and pleasant, and perhaps deserve to be termed a song. While in pursuit of insects it will hunt along the ground, among the trees, or upon the wing.

Immediately upon their arrival in spring both sexes indulge

in an active gambol among the trees, but very soon settle to nest-building, and pair off to rear their family of two.

Two other species of Caterpillar-eaters, the Pied and Jardine's, are rarer than the above.

Nest.—In all cases a very small and shallow structure—often a flimsy one—made of grasses, and partly covered with cobwebs; placed upon a horizontal bough, or, more rarely, in a fork.

Eggs.—Two or three to a sitting; light green, with chestnut-brown or wood-brown spots and blotches. Length, 0.75 inch; breadth, 0.6 inch.

RUFIOUS SONG-LARK,

***Cinclorhamphus rufescens*, Vig. and Hors.**

Sing-klō-ram'jus rö-fes'ens.

Kigklos, a bird; *ramphos*, a curved beak; *rufescere*, to redden.

CINCLORHAMPHUS RUFESCENS, Gould, "Birds of Australia," fol., vol. iii., pl. 76.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 8, 9.

KEY TO THE SPECIES.—General appearance rufous-tinted; throat and abdomen whitish; upper tail coverts rufous; inner secondaries nearly equal the primaries in length.

It will come as a surprise to many to know that we have Song-Larks in Australia. Not only is this so, but we also have, in many parts of the south, the British Singing Lark, a highly popular introduction.

Certainly, our two species do not equally compare with the bird of the fatherland, because their song, though strong, is not so rich or so prolonged.

Although we generally call the *Cinclorhamphi* the Song-

Larks, there is another in most parts of southern and western areas more worthy of the name. I refer to the Bush-Lark, or Pipit-like bird (*Mirafra*). While the Cinclo-rhamphus sings in the day, the *Mirafra* sings in the night.



Rufous Song-Lark.

Mr. North says this bird is the only Australian bird that does so, while Mr. Gilbert champions the cause of the Long-billed Reed-Warbler (*Acrocephalus*).

The second species of the genus is the Brown Song-Lark, a

bird of more heavy build and darker plumage. The sexes differ very much in size. Both mount into the air, but it is the male that sings so enthusiastically when his mate is beneath upon the nest.

It is a pleasant sight to see the tremulous mount made high into the air, and to hear the rich and voluble singing of the bird. Such a flight may be maintained for a long time, or the bird may prefer to make several voyages, coming each time to one or other tree in the vicinity of its nesting mate.

It is what we call a migratory bird, going north a few hundred miles after summer, and returning south with the early notices of spring.

In the Murray River district it will breed from September on to November; in the more southern portions, from October to December.

Nest.—A small cup-shaped structure, made of grasses, and placed in a slight depression of the ground. This may be covered with bushes or grass as a protection.

Eggs.—Clutch, three, or possibly four; pale purple-white, with spots of chestnut evenly and freely distributed over the whole surface. Length, 0.75 inch; breadth, 0.6 inch.

WHITE-THROATED THICKHEAD,***Pachycephala gutturalis*, Lath.***Pak-i-sef'a-lä gut-u-ra'lis.**Pachus*, thick; *kephale*, head; *guttur*, throat; *alis*, pertaining to.

PACHYCEPHALA GUTTURALIS, Gould, "Birds of Australia," fol., vol. ii.,
pl. 64.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6.

KEY TO THE SPECIES.—*Male*—Under surface rich yellow; pectoral collar jet black; throat white; head black; only terminal part of tail black, basal part grey, washed with olive.

Female—Throat pale brown, with white spots; under parts buff, without streaks; under wing coverts whitish; general colour above, head, neck, upper tail coverts, and tail olive-brown; wing coverts and secondaries blackish-brown, edged with reddish-brown; primaries edged with grey; bill stout and black.

Young—Uniform grey.

Fledgling—Rusty colour, lighter brown on wings.

"THE *Pachycephala gutturalis* may be regarded as the type of this genus, the members of which are peculiar to Australia and the adjacent islands to the northward. Their habits differ from those of most other insectivorous birds, particularly in their quiet mode of hopping about and traversing the branches of the trees in search of insects and their larvæ. Caterpillars constitute a great portion of their food."

This was that great ornithologist, Mr. John Gould's, impression of the representative species under present notice.

The species has three phases of plumage, very distinctly different from each other—(a) rufous, (b) grey, (c) yellow, white, and grey. My correspondent, Mr. Geo. Graham, corroborates my observations on this point in the two notes of observations which he has been good enough to send me.

He notes that the male grey bird has a trace of the black

pectoral collar only, and the merest speck of abdominal yellow. The male of this pair of breeders, when first seen, while selecting a covert in which to build (10th October approximately), appeared uniform grey, and darker upon the crown. The pectoral collar could only be faintly distinguished on the 10th December.

To watch a pair that is not in nuptial plumage is easy and pleasant work when it has selected the portion of dense covert it intends to occupy with a nest. Like many birds, they have a way of letting one know the place is sacred to them for a season.

NESTING HABITS.

Observation I.—September–October, 1899. Heytesbury Forest.

25th September.—First egg laid in nest.

26th September.—Second egg laid in nest.

12th October.—Young hatched out, having a little reddish down on body.

16th October.—Grey quills rise from wings, tail, and along ridge of back.

20th October.—Rufous feathers growing rapidly on wings and back.

21st October.—Eyes of young open; feathers forming on breast and neck.

23rd October.—Young leave nest; feathers formed on crown.

Observation II.—October–November, 1899. Heytesbury Forest.

15th October.—Building of nest commenced, the female alone doing the work from start to finish.

28th October.—Nest completed, and first egg deposited in it.

29th October.—Second egg laid.

14th November.—Young birds hatch out of shells.

23rd November.—Eyes open.

25th November.—Young leave the nest.

29th November.—Young birds are separated, each parent taking charge of one and exclusively feeding it. The wings have assumed a darker colour.

The young come to receive food at the calls of the guardians, each obeying the call of its particular one. No cross purposes seem to be entertained as regards food.

A young bird taken from a nest and placed in a cage freely caught flies upon the bars of the cage for twelve days, largely living upon them in preference to the food supplied by its captor.

A phase of this first plumage is the throat of the rusty-brown bird becoming greyish-white (February, 1897), while, from what I have seen in the field, another phase when examined would, I believe, show the throat to be rusty-brown—the second last place (wings last) to remain rusty-brown in the complete change from phase 1 to phase 2.

An example of the February phase bird above was held under observation by Mr. Graham until 25th July. He lost sight of it between the 18th and 25th July.

This inclines me to believe that the rusty-brown or first plumage is retained for more than six months, and that it gives way to the grey or second phase in time for the first breeding season—a season of immature and very modest plumage. The want of competition surely is the male bird's champion! Phase 3, of a male that must be at least two years of age, is an elegant one. Also, I met one in December, 1894, that was quite an exception to "bright plumage indicating weak powers of song," for it had so powerful a voice that when I heard the ringing music I felt entranced. Although years have passed, so delightful was the song that it still seems to ring with the full enjoyment of that time.

I met during the same week with a second specimen of this bird with phenomenal voice, but only on those two occasions have I heard the strong, sweet, clear, and regular series of running notes.



Grey-tailed Thickhead.

Judging from specimens seen in June and July, it is a winter resident of the southern portions of S.E. Australia.

The Western Australian representative, and very near of kin, is *P. occidentalis*, the Western Thickhead.

Tasmania is represented by *P. glaucura* (Grey-tailed Thick-head).

Nest.—Saucer-shaped structure, neatly but loosely made of dry grasses and rootlets, with lining of finer material; placed in forks of scrub, and a few feet only from the ground,

Eggs.—Three eggs to a sitting; ground colour varies considerably, from a creamy-white to the ordinary brownish-buff, over which are dark brown, with paler lilac spots, as if beneath the surface; a zone is formed at the broader end. Length, 0.95 inch; breadth, 0.65 inch.

RUFOUS-BREASTED THICKHEAD,

***Pachycephala rufiventris*, Lath.**

Pak-i-sef'a-lü rü-fi-ven'tris.

Pachus, thick; *kephale*, head; *rufus*, red; *venter*, abdomen.

PACHYCEPHALA PECTORALIS, Gould, "Birds of Australia," fol., vol. ii., pl. 67.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—*Male*—Throat white; under surface orange-brown; ashy-grey above; bill at nostrils equal in height and breadth.

Female—Throat and cheeks white with dark brown streaks; under parts light fawn, distinctly streaked on breast; lores and ear coverts ashy-brown.

THE name "Thickhead" refers to the noticeable breadth of the cranium.

In habits it is very much the same as the previous species, though it spends much of its time away from creeks, and breeds, as a rule, in the saplings of dry places. In this respect it differs from *P. gutturalis*.

The note of the bird is terminated by a smack as if made with a whip, resembling somewhat, but much inferior to, the crack of the "Whip-bird" (*Psophodes*).

Although a winter resident, it is nomadic, passing from place to place with its young, which do not mature for at least two years.

A similar species, occupying the fringes of the Mallee country, is Gilbert's Thickhead, *P. gilberti*, Gld. It has a rusty-red throat and sandy-buff under wing coverts.

A further plain-coloured species is found in the moist and heavily-timbered lands of the east---i.e., *P. olivacea*, V. and H. It has a whitish throat, freckled with brownish, dull fawn below and olive on the upper surface.

Nest.—Almost identical with that of the preceding species.

Eggs.—Basal colour, after the nature of olive; a zone of spots of a similar shade (stronger) round the broad end. Three to a sitting. Length, 1 inch; breadth, 0.8 inch.

GREY SHRIKE THRUSH

(HARMONIOUS SHRIKE-THRUSH),

***Collyriocincla harmonica*. Lath.**

Ko-lir-i-ō-sing'kla här-mon'i-kä.

Kollurion, a shrike; *kinklos*, a bird; *harmonicus*, musical.

COLLURIOCINCLA HARMONICA, Gould, "Birds of Australia," fol., vol. ii., pl. 74.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

KEY TO THE SPECIES.—General appearance grey; bill blackish; back umber-brown, contrasting with grey head and rump; bill stout, 1 inch long; white loreal spot very distinct; no distinct eyebrow in adult; second primary longer than secondaries.

WE have with us Song-Thrushes---i.e., the introduced British Thrush—Ground-Thrushes, and Shrike-Thrushes, but the most

useful of all is the species under review. Of Shrike-Thrushes there are nine species in Australia. They are mostly tropical, whilst one, *C. rectirostris*, is found only in Tasmania.



Grey Shrike-Thrush.

The Grey Shrike-Thrush stays close to well-watered lands during the summer, and with the advent of autumn it approaches the towns, amid which its clear, ringing notes are heard.

The generic name has been quite truly applied, *Collyriocincla* meaning Thrush, or possibly a second construction, "a particular kind of bird that has one note distinctly and boldly given." But it has a rich, sweet voice as well, and for that reason it earned the name of *harmonica*.

If, while you are in the bush, you hear a rustling noise among the light branches of the timber you will in all probability be safe to assign the cause to the Grey Shrike-Thrush, as the effect is so different from that caused by small birds in the scrubby creek land. It is heavy-footed and seemingly careless, its size and awkwardness appearing out of place amongst the quiet of the matted vegetation in a humid gully.

I once heard a naturalist say he hunted high and low for small worms and insects in a certain gully, but without success, thanks to the Thrush, who is the self-constituted police bird of these same gullies, keeping in subjection the snails and other vermin that quickly disturb the balance of nature if allowed unchecked sway.

The watchfulness of the bird applies as well to hundreds of hillsides upon which fruit trees have in recent years been planted. This creek-loving species is, in fact, ubiquitous.

It has a varied taste, and any creeping thing does not come amiss. It tugs away at a cluster of woven leaves till the hidden spider's nest or that of certain caterpillars is dissected, or carefully pries into any suspicious-looking corner that is likely to harbour a good-sized beetle. Among many curious forms I drew from a Thrush's gizzard a young lizard in good order, and in length 2 inches, which had evidently just been swallowed.

The usual nest is described below, but on two occasions, on the 25th November, 1894, I discovered two nests, neatly lined with mud, as if smoothed off into a spherical form by the aid of a trowel; each of these nests contained eggs.

There is a great likeness to the nest of the introduced Thrush in this particular build.

The month of November gives the majority of nests containing fresh eggs. As late as January a peculiar nest was discovered and described to me. It was placed on the sea beach, just 4 feet above high water, and at the edge of the bank. The birds could fly out of the nest just as if it was that of a Pipit. It was not strongly built, and contained three young, which were taken away some 50 yards distant by my friend, who found them. The birds followed and objected, and when the young were returned one parent immediately settled upon them with great joy.

Nests may be placed in stumps of trees, in large hollows, or in a tangle of twiners. It is cup-shaped, made of bark, and just sufficiently large to accommodate the sitting bird.

A species closely allied, but comparatively rare, is *C. rufigaster*, Gld., the Rusty-breasted Shrike-Thrush.

Nest.—Cup-shaped and deep, composed of bark and fibres, and placed among twining plants, or in the hollow of a tree-spout, or even in the bole. The illustration shows a spout nest.

Eggs.—Four to a sitting; ground colour clear white, with spots of chestnutty-brown and bluish-grey upon them. The spots and blotches may vary considerably in their density and their disposition. Length, 1.1 inches; breadth, 0.85 inch.

SPOTTED BABBLING-THRUSH

(SPOTTED GROUND-THRUSH, GROUND-DOVE),

Cinclosoma punctatum, Lath.

Sing-klo-so'ma punkt-ā'tum.

Kigklos, a bird; *soma*, a body; *punctatus*, dotted.

CINCLOSOMA PUNCTATUM, Gould, "Birds of Australia," fol., vol. iv.,
pl. 4.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 5, 6, 7.

KEY TO THE SPECIES.—*Male*—Throat and narrow band across chest steel-black; forehead and chest ashy-grey; crown of head black; rump and inside tail feathers rufous-brown; shoulders and wing coverts steel-black, each feather with white spot at tip.

Female—Throat greyish-white instead of black; no black breast-band; spot on neck rufous instead of white.

TRUE Babbling-Thrushes are remarkable for their strong, clumsy feet and powerful, rounded wings, and not so much as a whole for their powers of babbling. The Australian members of the group (Crateropodes) are a rather silent set, but they answer exactly to the structural description.

The Spotted Babbling-Thrush is met with in the damper parts of the south, while the Chestnut-backed is the most numerous in the dry areas, though no one species can be said truly to be common anywhere. A third species, *C. cinnamomeum*, Gld., is associated in comparatively small numbers with the latter bird. At all times the bird is shy, and keeps to scrubby timber.

It performs a similar service to mankind that the Ground-Lark (Pipit) does on the adjacent open, and the Plover on the common beyond, all feeding upon terrestrial insects, and helping to maintain the balance of nature perfectly.

To absolutely prohibit bird friends from frequenting the

environs of your "lease" would mean the cultivation of insect enemies a thousandfold, and to eventually assign it all to them. Vegetable and mineral poisons solely used in the subjugation of noxious insects prove enormously expensive when compared with the birds' labour charge.



Chestnut-backed Babbling-Thrush.

This species associates in small flocks, or in pairs, upon the ground, in the vicinity of gravel beds where these are present. In April little flocks are seen of some 15 to 20 birds.

It is much more difficult to secure than a Quail. If the latter rises, it does so near one, and the experienced gunner is enabled to kill the bird; but the Thrush, which flies also quickly, with a burr, rises so far ahead that a shot fired at random serves only the purpose of frightening other birds and disturbing the general peace.

The nest is placed upon the ground, and the complement of eggs is two.

In November I have found them, with the assistance of the sitting bird, who suddenly quitted the nest as I approached, feigning a broken wing—a ruse adopted by many other ground birds, including the European Lapwing, when the nest is in danger. The White-fronted Chat offers also a well-known Australian example of bird prone to this habit.

The flight of the Babbling-Thrush is an undulatory one.

The Mountain-Thrush (*Geocichla lunulata*, Lath.) is a bird of similar habitat, showing a preference for moist land, such as that in the vicinity of creek banks. It is well distributed, and is the most familiar of the three species known on this continent. The nest is a bulky one, placed off the ground, and the eggs are laid as early as July, sometimes in the company of the Lyre-bird of moister districts.

Nest.—Placed upon the ground, and mostly in a slight depression. It is cup-shaped and made of grasses.

Eggs.—Two or three for a sitting; white, with large brownish marks upon them, varying in intensity, with some as if beneath the surface. Length, 1.3 inches; breadth, 0.9 inch.

WHITE-BROWED BABBLER

(CHATTERER, CAT-BIRD),

Pomatorhinus superciliosus, Vig. and Hors.

Pō-ma-to-rī'nus sū-per-sil-i-ō'sus.

Poma, a lid; *rhinus*, nostril; *super*, over; *cilium*, eyelid.

POMATORHINUS SUPERCILIOSUS. Gould, "Birds of Australia," fol., vol. iv., pl. 22.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—Distinct white eyebrow; lower breast whitish, without any rufous; forehead and crown brown; culmen long, and longer than tarsus; wings rounded ($3\frac{1}{2}$ inches long).

It is characteristic of certain species of birds to be gregarious. In this disposition there are ways employed that vary greatly from one another, such as those of the Crow, Martin, and Quail.

The manner of life of the Babblers differs from most birds, yet agrees with that of the Grey Jumper (*Struthidea*) or Chough (*Corcorax*). All are noisy. Each associates in a number, from 6 to 10, and the three genera, very dissimilar in form, are ground-loving birds, even though they are correctly termed "Passeres" or "Perchers" because of their structure.

The power of flight in the Babblers is very limited, its greatest use being to convey the birds from the top of one sapling to the bottom of another.

The company talks a great deal, hops over the ground energetically, and when disturbed jumps from bough to bough until each has got well up the young tree. They never seem to rest a minute. With the wing and tail well spread, and carried much above the plane of the back, a group presents a strange sight, and one quite peculiar to the genus.

When disturbed the notes of the birds become very much

mixed in a harsh jumble. The comparison with the mew of the cat is not nearly so good as with that of the Cat-bird (*Aelurædus*) of New South Wales.

In Victoria there are two common species of Babblers, the



White-browed Babbler.

one under review and *P. temporalis*. While the former is located chiefly in the north-west, the latter is in the south-east.

A third species, *P. ruficeps*, Hart., is to be found mostly in

the interior of the continent, and is more a border bird or visitor to the parts at present being civilized.

P. temporalis has been called, because of its partiality for this pest, the "Codlin-moth eater." In any case, it is a most useful friend to the cultivators of introduced fruit trees.

The fourth species of the genus is a resident of North-Western Australia, extending into Central Australia.

The nesting habits of the genus are comparatively strange. About half a dozen nests are built before a decision has been made in which one the eggs are to be finally laid. This habit gives a very great advantage to the birds in the preservation of their eggs, for animals with felonious intent can visit five nests before finding the particular one desired, and may well give up the search before reaching the sixth.

The whole flock join in the nest-building—a kind of mutual aid arrangement—and three to five eggs are laid by each pair.

Nest.—Rugged appearance, large and spherical, with side entrance, spouted; made of twigs, and lined with grasses, &c.; situated in a small tree.

Eggs.—Four eggs generally to a sitting; pale brown, with peculiar cobweb or hair-like lines irregularly placed upon them. Length, 1 inch; breadth, 0.35 inch.

STRIATED FIELD-WREN

(STRIATED REED-LARK),

Calamanthus fuliginosus, Vig. and Hors.

Kal-a-man'thus fu-li-ji-no'sus.

Calamus, a reed; *anthus*, a small bird; *fuligo*, soot.

CALAMANTHUS FULIGINOSUS, Gould, "Birds of Australia," fol., vol. iii., pl. 70.

GEOGRAPHICAL DISTRIBUTION.—Areas 4, 5.

KEY TO THE SPECIES.—General appearance olive-green, much streaked; head olive-green, streaked with black, like back; breast, sides of body, flanks, and under tail coverts streaked with black; secondaries about equal.

THE Striated Field-Wren prefers the marshy, low growth of the sea border to the rough grassy flats of the interior. In southern Gippsland one may at almost any time obtain a variety of skins if they are needed for scientific purposes.

The bird from a little bush-top sings sweetly, merrily, and continuously, with its brownish tail erect and ever restless. The tail appears by its movements to be an extraordinary appendage to the bird, for, besides other actions, it indicates the bird's intended course of flight by being directed in the opposite direction to that course, differing in this respect from the Blue Wren, which lowers its long tail to the plane of its body on the first flight motion.

As an insectivorous bird it is a worker in the sour lands. Although this rank grass, such as may be found along the south-eastern coast, may appear of small commercial value, it is important that these breeding grounds of noxious insects be patrolled by the Calamanthi.

Two species of this genus extend across the dry areas from New South Wales into Western Australia—*C. campestris* and *C. isabellinus*.

Nest.—Cup-shaped, and made of grasses, with a light feather lining within it. It is placed in damp ground at the foot of a bush or tussock. This species breeds during the coldest months of the winter.



Field-Wren.

Eggs.—Three to the clutch; much bulged in form, and having a colour varying between a reddish-brown and a chocolate, and faintly spotted towards the larger end with a colour closely assimilating. Length, 0.75 inch; breadth, 0.55 inch.

WHITE-BROWED SCRUB-WREN

(WHITE-FRONTED SERICORNIS),

Sericornis frontalis. Vig. and Hors.

Ser-i-kôr'nis fron-ta'lis.

Serikos, silken; *ornis*, bird; *frons* (*frontis*), front; *alis*, pertaining to.

SERICORNIS FRONTALIS, Gould, "Birds of Australia," fol., vol. iii.
pl. 49.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 7.

KEY TO THE SPECIES.—General appearance sombre; plumage silky; throat white, with black spots or edgings to feathers; tail square, with no distinct subterminal band; no white tips to tail feathers; wing coverts black, tipped white; a white spot over lores; under tail coverts pale yellowish; tarsus plain.

OF the eleven species of Scrub-Wrens (*Sericorni*) the one under review is the most typical.

Notes on the Warblers can hardly be complete without a few remarks on a sturdy little bird that is better known to cryptogamic botanists than to other collectors who are not devoted to ornithology. It is only when one is hunting quietly in that particular kind of timber which yields mosses and lichens abundantly that one is likely to become acquainted with the White-browed Scrub-Wren.

The call and notes of the bird are sharp, clear, and decisive, and the activity it displays leads it quickly from place to place, principally under cover, but occasionally to one or other bush track, when all is quiet.

The place of habitation for its callow young is lodged among the coarse grass or overhanging twining plants on creek banks. The moist spots are sought for, preference being given to them at all times. During the September of 1896 I found a nest made of seaweed placed in a dead branch almost enveloped in the same material.

By my wish, a correspondent and clever observer, Mr. Geo. Graham, gave his attention to the nidification, and made the following observations upon this bird.

He finds it to be one of the earliest nesters in his district.



White-browed Scrub-Wren.

Before any sign of a nest was shown, a *Sericornis* placed a few grasses together in a thick-leaved bush, and continued to increase the mass for 30 minutes. Then it discontinued, and uttered a number of grating notes, appealing to its mate,

seemingly—who had been hopping about near by watching the operation—for a recognition of its work. This was at 11 a.m., when it adjourned work till 6 a.m. the following morning. Then one hour's work was given to the nest. During the whole of the time a series of peculiar grating calls was given, and nothing more was done till the same hour of the third morning (18th September, 1896).

The roomy cell of homogeneous plant matter then received the addition of an inner wall of another vegetable material (mainly old withered leaves). The bird now made an alteration in the time table, and during the fourth, fifth, and sixth mornings it laboured from about an hour before noon to an hour after, working leisurely throughout the time till the lining was completed. On the seventh day the first egg was laid; colour, brownish-purple spots and short streaks on a ground of lighter similar shades. The second egg was deposited on the ninth day, and the third egg on the eleventh. On the fourteenth the bird had well set itself to the task of incubation.

In regular visits to four nests Mr. Graham found the eggs to be laid each forenoon early. The young birds hatched out on the twenty-third day from the time of laying of the third egg, and the young were able to fly on the fifteenth day from the breaking of the shell. The family immediately begins a nomadic life, and the locality of the nest is left to other birds on the morning of the day following that on which the young birds have learnt the art of flying.

During the time of incubation the sitting bird leaves the nest to feed at early morning and evening, and at night returns with a small feather or some downy plumage, so that gradually the internal layer of its house is completed to its satisfaction. In six nests observed in that district—the Heytesbury Forest—two were lined with the fur of rabbits, the others with feathers. All were inclined, with the entrance

protected from above, and faced the north-east, which is the fine quarter at this period of the year.

It was noticeable that the intelligence of the birds led them to build the external portion of their dome nest during rain



Spotted Scrub-Wren.

or in the early morning, when the wiry grasses were pliable and the wet-softened material could be the more easily adjusted to the required shape, while the inner layer was constructed at mid-day, when the material was drier.

My last visit to certain timber frequented by the Sericornis enabled me to witness an interesting little scene. It showed me that the forms of gallantry on the part of the male Sericornis in his courtship are as intense as in the most chivalrous of other birds. How those two males courtesied before the lady bird one could not witness without a good-natured smile, bowing, as they did, deeply, stately, and continually, like any old-fashioned knight of early times trying to win the favour of his lady. How the momentous matter terminated I was not able to discover. Doubtless the knight of better points won the day, and the other went afield for a second trial of his strength.

The Spotted Scrub-Wren is the species inhabiting Western Australia. The habits are similar to those of *S. frontalis*.

Nest.—Oval, side entrance, made of grasses and lined with feathers, &c. It is placed in low, rank vegetation, and always well hidden.

Eggs.—Three or four to a sitting; deep fleshy white, with a zone of purplish-brown spots about the larger end. Length, 0.75 inch; breadth, 0.6 inch.

WHITE-FACED TITMOUSE

(WHITEFACE),

Zerophila leucopsis, Gld.

Ze-rof'il-ä lū-kop'sis.

Xeros, dry; *philein*, to love; *leukos*, white; *ops*, face.

XEROPHILA LEUCOPSIS, Gould, "Birds of Australia," fol., vol. iii., pl. 67.

GEOGRAPHICAL DISTRIBUTION.—Areas 6, 7, 9, occasionally 2 and 4.

KEY TO THE SPECIES.—Under surface white; upper surface brown; forehead white; tail square; first primary larger than half second; bill higher than broad; nostrils in a semi-operculated groove, round, and partly hidden by feathers.

THERE are three species of "Whitefaces." One has its habitat in Central Australia, a second is rare in the north-west of Victoria and South and Western Australia, while the third is found in the dry parts of Victoria, New South Wales, and further inland.

It is a cheerful little bird, delighted if permitted to build under the verandah of the house, and to act as a scavenger about the property. Although omnivorous to a degree, it is specially insectivorous. The presence of such a bird about a farm is worth cultivating, for it allows nothing eatable to waste, and thus indirectly helps to prevent germ growth.

It is unfortunate that the introduced Sparrow (*Passer domesticus*) does not confine itself to this exact occupation in the country, which it well performs in a town.

In most respects the Whiteface is a Tit. The bill, however, is more like that of a grain-eater than that of a Tit, and separates the two species. It associates in small flocks of a dozen, more or less, and upon the ground pries into whatever is likely to afford a meal. As the name implies, it is a lover of dry districts.

With regard to its nesting, it is not particular where it builds. I once saw a nest in the rolled up side-flap of a waggonette. The birds, possibly thinking it was of no use to the owners, built a nest in a corner of it. During the period



White-faced Titmouse.

of incubation the sitting bird made two journeys of 24 miles each without suffering any disturbance, and on each occasion was kindly received by its mate on return. Unfortunately

the flap was lowered by a stranger, and the eggs and nest were destroyed.

In the same family, and occupying the same class of country, is the Wedgebill (*Sphenostoma cristatum*, Gld.) The call of the Wedgebill is very sweet, and expressed phonetically it would sound like "Kitty-lin-tof." The White-faced Titmouse is a bird very much smaller and without a crest.

Nest.—Loosely constructed oblong and open nest, made of grasses, and lined with feathers, &c. It may be placed in bushes or such places as under the eaves of verandahs.

Eggs.—Five to the clutch; much freckled with reddish-brown on a faint white ground. Length, 0.8 inch; breadth, 0.6 inch.

GREY JUMPER

(APOSTLE-BIRD),

Struthidea cinerea, Gld.

Strö-thid'ē-ä si-nē'rē-ä.

Strouthos, a small bird; *eidōs*, form, appearance; *cinereus*, ash.

STRUTHIDEA CINEREA, Gould, "Birds of Australia," fol., vol. iv., pl. 17.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 6, 7.

KEY TO THE SPECIES.—General colour grey; wings pale brown, darker on inner webs of quills and centres of wing coverts; tail glossy black; lining of wing pale ashy-brown; iris white; bill conical. Total length, 12½ inches; wing, 6 inches.

AUSTRALIA has many anomalous birds, among them being the Grey Jumper, of which a single species only is known. The Magpie-Lark, Chough, and Grey Jumper all build large mud nests in the same style of architecture, varying only in size. That of the Chough I found to weigh 9½ lbs., the others being

less than half this size. The habitat is the dry part of New South Wales and South Australia, from whence it makes its way into the most north-westerly portion of Victoria. The general habits of this species assimilate with those of the



White-winged Chough.

Babblers and Chough (*Pomatorhinus* and *Corcorax*), while, of the three, it is at times the most noisy. Three or four, or even a dozen, associate in the branches of the trees, and quickly passing from limb to limb, with expanded wings and

tail, they present rather a comical appearance. It is a noticeable feature in winter to see about a dozen together, from which the common name "Twelve Apostles," or Apostle-bird, has been derived.

The Chough, in disposition somewhat like the Jumper, is also the only known representative of the genus in Australia. It is in appearance a slim kind of Crow, with red eyes, long tail, and a white mark upon the wing, distinctly seen when the bird is hopping about the ground. It also is insect-ivorous.

The White-winged Chough is commonly called the Black Jay, and confused with the Black Magpie (figured elsewhere). A comparison of the plates will show the difference.

Nest.—Made of mud, circular, and placed upon a horizontal bough ; lined with grasses. Diameter of bowl about 5 inches.

Eggs.—Three or four, sometimes five, to a clutch ; the ground is white, with blackish-slate spots, varying in density and in number ; some being nearly all white—milky white. Length, 1.2 inches ; breadth, 0.8 inch.

BELL-BIRD

(CRESTED OREOICA),

Oreoica cristata, Lewin.

O-re-o'i'ka kris-ta'ta.

Oros, a mountain; *oikos*, dwelling; *crista*, a crest (*cristata*, tufted).

OREOICA GUTTURALIS, Gould, "Birds of Australia," fol., vol. ii., pl. 81.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 6, 7, 8, 9.

KEY TO THE SPECIES.—*Male*—Crest deep brownish-black; upper surface reddish-brown; forehead and lores white; black stripe extends over cheeks and unites with black of lower throat; chin and upper parts of throat white; upper part of breast deep brownish-black; lower breast and abdomen white. Total length, 8.5 inches.

Female—Lighter in colour; lower throat and upper breast nearly uniform reddish-brown.

THE Crested Bell-bird is an inhabitant of the lower reaches of the Murray River and north and west throughout the continent. It is not to be confused with the Bell-bird of the forest land of S.E. Australia, which is correctly termed the Bell-Minah, being classed as a Honey-eater with the Native Minah.

The *Oreoica cristata* is the only species of the genus, and is confined entirely to this continent. The actions are spirited—a series of hops—and when disturbed a flight into the nearest tree. The bulk of its food is found near or upon the ground, consisting, as it does, of insects, their larvæ, and seeds. In many respects it is like the *Collyriocincla* that frequent the drier regions. It stays in the same district during the winter and the summer, and in October sets about the preparations for rearing a first brood.

Mr. Gilbert, the able coadjutor of Gould, describes accurately the vocal powers of the species. "The most singular feature," says Gilbert, "connected with this bird is that it is

a perfect ventriloquist. At first its note commences in so low a tone that it sounds as if at a considerable distance, and then gradually increases in volume till it appears over the head of the wondering hearer, the bird that utters it being all the while on the dead part of a tree perhaps not more than a



Bell-bird.

few yards distant, its motionless attitude rendering its discovery very difficult. It has two kinds of song, the most usual of which is a running succession of notes, or two notes repeated together rather slowly, followed by a repetition three times, rather quickly, the last note resembling the sound of a bell from its ringing tone. The other song is

nearly the same, only that it concludes with a sudden and peculiar fall of two notes."

Nest.—Cup-shaped and deep; made of bark, and lined with fibres, &c.; placed in proximity to the ground.

Eggs.—Two, or rarely three, to a clutch. They vary considerably, and may have the ground a very pale bluish-white or white; the dots dispersed upon them may be black, or peculiar blotches and crescents, closely or broadly separated. Length, 1 inch; breadth, 0.8 inch.

SACRED KINGFISHER

(WOOD KINGFISHER),

***Halcyon sanctus*, Vig. and Hors.**

Hal'si-on sangk'tus.

Hals, the sea; *kucin*, to breed (*alkuon*, a Kingfisher); *sanctus*, sacred.

HALCYON SANCTUS, Gould, "Birds of Australia," fol., vol. ii., pl. 21.

GEOGRAPHICAL DISTRIBUTION.—Over the whole of the continent, and occasionally in Tasmania.

KEY TO THE SPECIES.—Head greenish-blue; upper surface varying between dull green and blue; under surface of body and under wing coverts orange-buff, as also the collar; bill compressed, culmen grooved laterally.

LIKE the Red-backed Kingfisher, *Halcyon sanctus* is not wholly piscatorial in habit. As a matter of fact, it is able to live in a desert for months, far away from water, subsisting there on lizards, small snakes, beetles, grasshoppers, and animals of a like nature. It may be found frequenting the arid coastal portions of the continent, and even the driest parts of Central Australia, provided only that gum trees, however withered, are available.

Essentially a hot-weather bird, it migrates from Victoria as the winter advances, remaining, however, throughout the year in the warmer districts of New South Wales and South Australia.

The clear, sharp, penetrating cry of the Sacred Kingfisher can invariably be heard by those passing through timbered lands, more especially should the intruder approach near its nest, when its angry demonstrations and fierce chatter often betray its whereabouts. Should one bird be sitting at the time, its mate will persistently attack the supposed enemy until the latter has retired to a safe distance from the hollow tree or creek bank wherein the nest has been placed.

The task of raising the family commences in October and concludes with a second brood in December.

It was believed by the ancients, and even by that famous old ornithologist Aristotle, that the Kingfisher is a breeder by the sea coast. In midwinter, he states, the birds gather in the rocky islets of the Grecian Seas to build their nests and bring out their young. For 14 days only they remain, their presence producing a calm sea during this period. "On the seventh day after the longest day the birds pass away."

Naturally, with our present knowledge of bird-life, and the time necessary for the rearing of the young, we cannot accept this fable of Aristotle as a scientific fact. Probably the birds were migrating for the winter months, their path of migration lying through the Grecian islands, which afforded a suitable resting place prior to crossing the Mediterranean into Africa. Aristotle possessed the half-truth only—hence his attempt to fill in the detail by the invention of a poetic fable.

Nest.—A hollow of a tree, or creek bank, with a small entrance; decayed wood is used in the first case as a floor for the eggs.

Eggs.—Four or five to a sitting; pearly white, and nearly round. Length, 1 inch; breadth, 0.9 inch.

GRASS-WARBLER

(CORN-BIRD).

Cisticola exilis, Vig. and Hors.

Sis-tik'ō-lä ek-si'lis.

Cistus, a rock rose; *colere*, to dwell; *exilis*, slender.

CISTICOLA EXILIS, Gould, "Birds of Australia," fol., vol. iii., pl. 42.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 5, 6, 8.

KEY TO THE SPECIES.—General description sandy-buff, much striped; tail strongly graduated or rounded. Total length, 4 inches.

Winter Plumage.—*Male and female*—Blackish, with streaked head and back.

Summer Plumage.—*Male*—Head rufous. *Female*—Head striped.

THE Grass-Warbler is seldom seen in settled districts until the settlers' crops have reached about 2 feet in height. Then, apparently when it considers that the hand of man has prepared for it a suitable nesting-ground, it deigns to appear, builds its delicate purse-like nest in the crop, rears its brood of young, and again disappears from the haunts of the farmer, probably leading a nomadic life in the heavily grassed country interspersed through the south of Australia.

In its native haunts it is in general particularly shy, hiding itself among the tussocks of its chosen home, and creeping about like a mouse in and out of the rank grass should danger be near.

Some years ago, during a visit to Phillip Island with a friend, I found the Grass-Warblers very plentiful, and, contrary to their usual custom, not in the least shy. Rising from the coarse grass, they fluttered slowly along the surface for some time like large brown butterflies. Indeed, at first sight it was often difficult to distinguish between the two as they started from a tussock at the same time, for in manner

of flight and colouration they closely resemble one another. Only on reaching the horizon did a fair comparison of their size reveal the distinction.

The time of my visit was the nesting season, November—



Grass-Warbler.

December, and I was afforded full opportunity of witnessing the extraordinary ruses adopted by these little birds for the protection of their nests. Whenever we saw a bird rise from the ground, my friend and I searched around the spot

diligently in search of a nest, but with no result. The bird had left its nest at the first sign of danger, and, mouse-like, run along the ground for some distance before taking to flight.

Even on returning they will never proceed directly to the nest, but, alighting several yards from it, hop along the ground, hidden by the long grass, and, guided by unerring instinct, so regain the nest. An all-day hunt on the part of my friend and myself resulted in the discovery of one nest only, and this only by patient search.

The calls of the male whilst in the air are of two natures—one a plaintive and soft note; the second a brisk whistle, immediately following the first.

Nest.—Small, oblong or pyriform, and side entranced; made of grass and other fine material, and suspended in coarse grasses, often in growing corn.

Eggs.—Three or four to a sitting; pale blue, spotted with reddish-brown of varying intensity. Length, 0.6 inch; breadth, 0.5 inch.

SILVER-EYE

(WHITE-EYE, RING-EYE, BLIGHT-BIRD),

***Zosterops cœrulescens*, Lath.**

Zos'terops sê-rö-les'ens.

Zoster, a girdle; *ops*, an eye; *cœrulescens*, bluish.

ZOSTEROPS DORSALIS, Gould, "Birds of Australia," fol., vol. iv., pl. 81.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7.

KEY TO THE SPECIES.—A ring of short white feathers round the eye; crown olive-green; back brown; under surface not uniform; throat white, sometimes tinged with olive.

ALTOGETHER there are 88 species of Silver-eyes known, 6 of which are found in Australia. Each side of the continent

has its common species. That in the western State is the Green-backed Silver-eye (*Z. gouldi*). The first of all Silver-eyes was described from a specimen obtained in the extreme south-east, and the largest species now occupies the small island of Norfolk.



Silver-eyes and Nest.

The family flocks are generally eight in number, and, as they travel through the orchards a slight warfare is made upon them, for in spring and summer they feast upon small

fruit, in autumn upon late apples. Certainly its taste for commercial fruits is cultivated when opportunity stares it in the face, but what about the good which I am sure it does? I remember seeing a Silver-eye hunting along a branch of a tall pear tree. An insect fell from its hiding place, and simultaneously the bird swooped perpendicularly in time to catch the lesser form, and with a right-angled movement escaped the ground, to which it was unpleasantly close.

It is the scourge of the aphids and other noxious insects when there is no fruit upon the tree, giving special attention in the wild timber to the Acaciae. I will quote a case beyond my own knowledge of its special service. Mr. W. H. F. Hill writes :—

“Amongst the birds the Silver-eye, *Zosterops carulescens*, is the chief enemy of the Case Moth, destroying the young larvæ in great numbers. Indeed, but for these useful little birds the Case Moths might easily become a serious insect pest, as they threaten to be in the various city parks and enclosures where the Silver-eye does not dare to go.

“During the autumn and winter months numbers of White-eyes come into the gardens in towns and eat off vast quantities of aphides from chrysanthemums and rose bushes. When pear slugs are full grown they feed on these to a large extent. Numbers of codlin moth grubs and other noxious insects are cleared off the trees or picked up on the ground by these industrious little birds. I am sure if anyone takes the trouble to observe them for a short time he will be convinced that their good deeds more than counterbalance their evil, and that without fear or hesitation they can be counted among the farmer’s feathered friends—one that in a quiet, unostentatious manner helps him in his daily fight against the multitude of pests with which he is waging continual warfare.”

In New Zealand the "Transactions N.Z. Institute" renders a very praiseworthy account of the good done by this bird as an aphid-destroyer.

Silver-eyes dread the tyrant Butcher-bird (*Cracticus destructor*), and I have found that one or two kept in the gardens with cut wings serve the purpose of good police when the grapes are ripening. Their voices are a terror to the Silver-eyes.

Nesting.—I have observed the callow young as late as 10th February, 1895, in the Australian Alps, where spring at a late hour follows winter. The eggs are laid on alternate days, and at an early age the young assume the general plumage of the adult, and then go through the details of the seasonal changes. The nest near grazing areas is formed of fibres, lined with the hair of the horse, cow, or other animal, and externally covered with mosses.

Nest.—Cup-shaped and deep, suspended; made of grasses, and surrounded more or less with green mosses. It is seldom more than 6 feet from the ground. The accompanying figure shows a typical cup-shaped nest.

Eggs.—Three or four to the clutch; uniform pale blue. Length, 0.6 inch; breadth, 0.5 inch.

WHITE-FRONTED CHAT

(JENNY-WREN, TANG, NUN),

Ephthianura albifrons, Jard. and Selb.

Ef-thi-a-nū'rä al'bi-frons.

Ephthos, perhaps languid; *oura*, tail; *albus*, white; *frons*, forehead.

EPHTHIANURA ALBIFRONS, Gould, "Birds of Australia," fol., vol. iii.,
pl. 64.

GEOGRAPHICAL DISTRIBUTION.—Areas 4, 6, 7, 9.

KEY TO THE SPECIES.—*Male*—Black crescent across white breast; throat white; forehead white; hinder crown black. Bill slender. Total length, 4 inches.

Female—The blacks and whites are much reduced in contrast, and all the parts are greyer.

THE White-fronted Chat is one of four very beautiful and conspicuous species of a genus peculiar to the Commonwealth, and, moreover, is worthy of note in so far as it is the only one of the three species of "Chats" that does not migrate northwards during the late summer.

A bird of graceful form and handsome markings, it is found associated in small flocks in the southern parts of Australia during the months between February and July, frequenting the high grass and low bushes of open country. The peculiar metallic "tang" uttered by these pretty birds as they fly off at the approach of a stranger is well known to those who have visited its haunts.

It is a nomadic bird, wandering freely through the large stretches of country suited to its habits, and, in an exceptionally severe season, will even leave the most southerly parts for more genial climes, never, however, wandering so far as to merit the term migrant.

The White-fronted Chat is an early builder. Before the end of July the males become most pugnacious, engaging in noisy

combat one with another until the females have been apportioned and the serious work of nest-building commenced. The cup-shaped nests are built at the base of herbs or grass-tufts, or sometimes amongst the bushes, 18 inches from the



White-fronted Chat.

ground. Three eggs are laid, one on each successive day, the young thus being hatched at intervals of 24 hours. These leave the nest on the twelfth day from the time of birth.

Should an infertile egg be laid, it is never cast out of the nest, but is allowed to remain, and may often be found long after the young have flown and the nest been abandoned. Both sexes take part in incubation and in the rearing of the young, the male bird taking as keen an interest in the process as the mother bird.

The nest of the Chat at times receives the unwelcome egg of the Narrow-billed Bronze-Cuckoo, and too often the unfortunate birds act in the capacity of foster-parents to the young of this parasite. Quite recently I found an egg of this species lying uncared for on the wide margin of a Chat's nest, where either it had been unfortunately placed by the Cuckoo in its hurry to deposit the egg, or, more probably, had been ejected by the owners.

Evidently these birds occasionally become attached to a particular spot, for during three successive seasons I noticed that two pairs built their nests at the bases of the same two tussocks of grass. There were thousands of other tussocks in the vicinity that could have been utilized for the same purpose without any special effort on the part of the birds, yet during this period the favoured spots were invariably chosen.

Nest.—Open, cup-like, with broad lip and still broader base; made of grasses, and lined with animal hair or fine grass; placed close to the ground in a shrub, or on the ground under a thistle or tussock.

Eggs.—Three or four to a sitting; white ground, with spots of reddish-brown, inclined to form a zone towards the broad end. Length, 0.65 inch; breadth, 0.5 inch.

TRICOLOURED CHAT,**Ephthianura tricolor, Gld.***Ef-thi-a-nū'rā tri'kul-or.**Ephthos*, perhaps languid; *oura*, tail; *tri*, triple; *color*, colour.EPHTHIANURA TRICOLOR, Gould, "Birds of Australia," fol., vol. iii.,
pl. 65.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 6, 7, 9.

KEY TO THE SPECIES.—*Male*—Crimson on forehead, crown, breast, and upper tail coverts; throat white; bill slender, about equal in height and breadth at nostrils.*Female*—Crown, breast, and upper tail coverts faint red.*Young male*—Upper tail coverts only red (strong red).

THE four species of Chats, without doubt, take a high place among the most beautiful bird forms of southern Australia. As remarked previously, they are confined to Australia, no representative of the genus being present in any other part of the world.

With the exception of the White-fronted Chat, which is fairly plentiful in the extreme south, the genus cannot be said to be common outside the warmer areas of the Commonwealth.

They are essentially tropical forms, offering, like many tropical birds, brilliant colouration; one appearing mostly crimson, and another a rich golden yellow. All agree in that they associate in flocks. The two brilliantly coloured members, occasionally the three, may be found breeding in the same districts.

The Tricoloured Chat summers in the south, but with the advance of winter migrates to the north, where it finds more abundant insect life amid the tropical lands of Queensland.

Anyone who sees this bird for the first time will readily endorse the expressions of admiration for its beauty to be found in the writings of Australian naturalists. When first

seen by myself, on the River Murray, a pair was flitting among the saltbushes in search of insects, appearing amid the comparatively drab surroundings like two flashes of crimson colour rather than birds of flesh and feathers. At the time of my visit (October) many nests contained eggs, and even young, whilst others were only in process of construction.

Nest.—In all respects the same as an average specimen of *Epthianura albifrons*, described above.

Eggs.—So much like those of *E. albifrons* that the difference in colouration and size is scarcely perceptible.

ORANGE-WINGED TREE-RUNNER

(BARK-RUNNER),

***Sittella chrysoptera*, Lath.**

Si-tel'ü kris-op'te-rü.

Sitte, a kind of woodpecker (*sittella*, diminutive); *chrusos*, gold; *pteron*, a wing.

SITTELLA CHRYSOPTERA, Gould, "Birds of Australia," fol., vol. iv., pl. 101.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6.

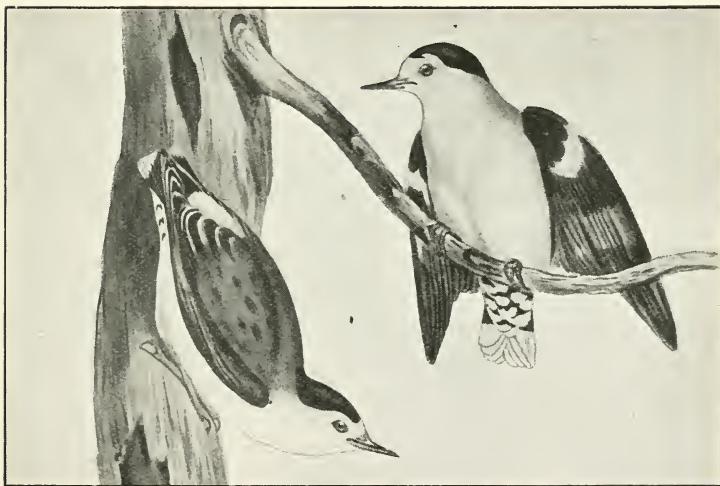
KEY TO THE SPECIES.—Middle third of wing quills forming a large rusty-red patch; breast and abdomen streaked with brown; crown of head dark brown. Bill pointed and slightly curved upwards; nostrils with a cutaneous valve.

OF the seven species of Tree-runners, four occur in the south of the continent; one—Black-capped Tree-runner—inhabits Western Australia as well as the eastern portion. The vernacular name indicates its habit of running along the

boughs of trees whilst searching every crevice for grubs and insects.

In contradistinction to the Tree-creepers (*Climacteris*), which move spirally upwards as they search for food, the Tree-runners work spirally downwards, the head towards the earth. Both genera, however, agree in so far as they both feed largely on hard-winged insects.

The *Sittellæ* go in small flocks of eight or ten individuals,



Black-capped Tree-runner.

and when disturbed fly heavily in a compact mass, appearing to be one solid body rather than several light bird shapes.

Of two specimens obtained on 25th July, 1896, I found that one, the male, had a yellow band at the base of upper mandible, evidently a sign of immaturity, as the sexes in the adult stage are, according to Mr. Gould, alike in this respect. When the male bird on this particular occasion lost his mate,

he flew round for some time uttering a plaintive "twit twit," then returned to the tree to continue his search for insects, exhibiting the while considerable restlessness.

One summer's day, some years ago, as I wandered along a river bank accompanied by my friends, the Messrs. Brittlebank, a little comedy was presented, in which a member of this species was the principal actor. We noticed in the branches of a gum tree by which we were passing a *Sittella* bearing a large grub in its bill. Wishing to watch the bird feed its young, which we knew could not be far away, we stood our ground and waited for developments. The bird was either in no hurry or objected to the presence of spectators; for ten minutes or more it continued to fly from bough to bough, until, perhaps moved by the appeal of its hungry young, it finally decided to creep down the main stem to a crevice in the bark where it had carefully secreted—temporarily, I presume—a fully fledged young bird, which greedily swallowed the juicy grub held by its mother.

After the departure of the parent, one of our party climbed into the tree and caught the young bird, who thereupon created such an uproar as to attract the attention of three adult birds who were in the vicinity. These joined their voices to the din, and forthwith commenced a fierce onslaught on our party, their graceful flight and boldness astonishing each one of us. Sweeping down with graceful curves, they showed some inclination to catch the hands that held the young one captive, yet retiring at the least movement on our part.

These delicate advances on the part of the angry birds had continued for some time, when three more entered the scene of action. These last comers, evidently young birds, however, remained a little distance away, not venturing to take an active part in the attack on our persons, but, much agitated, added their quota to the uproar and confusion by uttering startled cries and flying restlessly about.

The flying forms passing between and over the heads of our party produced a scene of animation that was most interesting to behold. Replacing the kidnapped young bird, we took our departure, and the birds, mollified by it, sought the higher branches of the trees.



Nest of Orange-winged Tree-runner.

Nest.—A clear case of mimicry of surroundings; small, rounded, and fitted in an upright prong to assimilate in form with the fork; made of downy portions of grasses, &c., and completely surrounded with spiders' webs, lichens, and bark. Inner lining of mosses.

Eggs.—Generally three to clutch, sometimes four; ground colour bluish-white, spotted and blotched all over with slaty colouring. Length, 0.6 inch; breadth, 0.5 inch.

BROWN TREE-CREEPER,

Climacteris scandens, Temm.

Kli-mak-ter'is skan'dens.

Klimakter, from *klimax*, ladder; *scandere*, to climb.

CLIMACTERIS SCANDENS, Gould, "Birds of Australia," fol., vol. iv.,
pl. 93.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

KEY TO THE SPECIES.—General appearance brown, with light streaks along the breast; central pair of tail feathers brown; orbital region brown; fawn-coloured band across wing; tail square, soft, and shorter than wing; bill slender, long and curved.

AUSTRALIA has seven species of Tree-creepers, of which five are to be found in the southern portion. In the western State there is a Rufous species; in Central Australia the White-browed and the Red-browed, both of which enter the Mallee country; in the south-east the Brown and White-throated, the last keeping more to the moist forest lands of this part.

The Brown Tree-creeper presents a more bulky appearance than its congener, the White-throated, a character which alone is sufficient to distinguish the species when found associated in the same area, bordering the open country on one side and the heavily timbered on the other.

The Brown Tree-creeper is found in greatest numbers in the Mallee fringes, a class of country which appears to offer great attraction to this bird, which finds in the rough bark of the She-oak (*Casuarina*) and Native Pine (*Callitris*) special facilities for obtaining a food supply. It is blessed with a prying nature, poking into logs and tree spouts, and occasionally hunting amongst a small pile of fallen timber in its search for insects.

The nest is built in the hollow of a tree, easily found by

anyone hunting for it, as the bird, continually emitting its piercing call, fearlessly enters or leaves the nest in full view of the observer.

Apparently the Tree-creeper needs little water, for it is rarely seen to drink.

Nest.—In a hollow of a tree, and composed of grasses and feathers.

Eggs.—Three to a sitting; deep flesh colour, with innumerable spots of reddish-brown. Length, 0.85 inch; breadth, 0.7 inch.

WHITE-THROATED TREE-CREEPER,

Climacteris leucophaea, Lath.

Kli-mak-ter'is lu-ko-phé'a.

Klimakter, from *klimax*, ladder; *leukos*, white; *phaios*, grey.

CLIMACTERIS PICUMNUS, Gould, "Birds of Australia," fol., vol. iv., pl. 98.

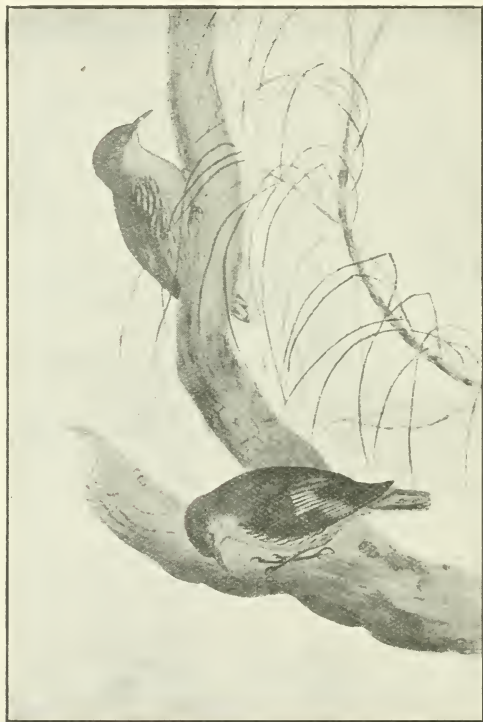
GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

KEY TO THE SPECIES.—General appearance brown; throat white; fawn-coloured band across wing; centre pair of tail feathers dark grey; tail square, soft, and shorter than wing; bill slender, long and curved.

It is a striking fact that there are no Woodpeckers in Australia, the nearest approach to such birds being the Tree-creepers, whose seven or eight species are distributed over the whole continent.

The White-throated Tree-creeper is a thoroughly arboreal creature, choosing as its habitat the heavy timber along the margin of a creek. Its manner of obtaining food is remarkable, and peculiar to itself. Alighting near the bottom of a large tree-trunk it ascends in a spiral course by a series of

short jumps, examining every inch of surface in this course for insects. As the observer watches the bird he will see that it disappears on the other side of the tree, only to reappear in a few seconds on the observer's side, but higher up the



White-throated Tree-creeper.

trunk. The search for insects causes the bird to continue this staircase movement until it has reached the branching forks, when it flutters down to the base of another tree, and repeats its previous performance. Insects clinging to the tree thus

have little chance of eluding the close scrutiny of the hunter, though perhaps some may escape if the spiral course be too wide. The Tree-runners (*Sittellæ*) may complete the work as they pursue their downward course (see p. 141).

I saw, on one occasion, a representative of each of these species thus working a single tree, though such must not be taken as a rule; mutual aid between individuals of different species is seldom practised.

The cry of the White-throated Tree-creeper is shrill and piping, easily distinguishable from that of other birds with which it may be found associating.

Nest.—At the bottom of the shallow hollow in a tree branch; built of grasses, and lined with feathers.

Eggs.—Three to a sitting; dull white, with spots of reddish-brown. Length, 0.8 inch; breadth, 0.65 inch.

COACHWHIP-BIRD

(WHIP-BIRD),

Psophodes crepitans, Vig. and Hors,

Sō-fō'dēs krep'i-tans.

Psophos, an inarticulate noise (*psophodes*, noisy); *crepitus*, a bursting noise.

PSOPHODES CREPITANS, Gould, "Birds of Australia," fol., vol. iii., pl. 15.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4.

KEY TO THE SPECIES.—General appearance olive-black; breast has white mottling upon it; lateral feathers of tail tipped white; lower flanks ashy-brown; head crested.

THIS genus is strictly Australian. In it there are two species, one inhabiting the eastern, and the other the western portions

of the continent. It is a close associate of the Lyre-bird, and may safely be regarded as one of the few recluse birds.

The call is like the crack of a stockwhip, the nearest approach to it being that of the *Pachycephala*, though the latter is weak in comparison. The clear, strong note of the Whip-bird, the clank of the Lyre-bird, and the toll of the Bell-bird are strange sounds in a wild and solitary glen. The Whip-bird has a low, inward series of sweet notes, in addition to the ordinary ventriloquial note, which seems to come from a bird in the far distance, finishing up a few yards in front of one with a powerful bursting crack, as its classical name indicates. I have watched for twenty minutes before finding the owner of such a call, so close is the tangle in which it lives.

The food consists of insects, which are obtained by scraping amongst the *débris* of a gully, the feet of the bird being strong and specially fitted for such an occupation.

Nest.—Open, shallow, loosely constructed, and composed of twigs, leaves internally. It is placed in a miniature jungle, and close to the ground.

Eggs.—Two to a clutch; ground colour bluish-white, marked over the surface by peculiarly shaped spots and blotches of black. Length, 1 inch; breadth, 0.75 inch.

STRIATED PARDALOTE

(STRIATED DIAMOND-BIRD),

Pardalotus ornatus, Temm.

Par-da-lo'tus or-na'-tus.

Pardalotus, spotted like the pardalis, pard; *ornatus*, ornamented.

PARDALOTUS STRIATUS, Gould, "Birds of Australia," fol., vol. ii., pl. 38.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

KEY TO THE SPECIES.—Head streaked white on hinder crown and occiput; all primaries edged with white, forming large wing patch; speculum red or yellow; strong, short bill, mandibles almost equal; nasal membranes concealed by plumes.

THE genus to which the Pardalote belongs is strictly Australian, is composed of eight species, and ranges throughout the continent. This particular species is practically ubiquitous. It is not so much a "Diamond-bird" in appearance as *P. punctatus* or the Forty-spotted species of Tasmania, but, being similar in structure and habits, it is placed in that class. The genus is quite an insectivorous one, and all its members breed in holes in the ground or in trees. It is generally thought *P. ornatus* breeds in both places. On this point further evidence is needed. This, I trust, will be supplied by some specially intelligent observer favourably situated.

Nest.—A drilled hole in the bank of a creek, or possibly a tree hollow, at the end of which (say 18 inches from the entrance) is a compact and rounded open nest of grasses, sometimes almost domed.

Eggs.—Four or five to a sitting; white, rounded. Length, 0.65 inch; breadth, 0.55 inch.

ALLIED PARDALOTE

(WIT-E-CHU),

Pardalotus assimilis, Rams.

(Sub-species of *P. ORNATUS*, Temm.)

Pär-da-lō'tus as-sim'i-lis.

Pardalotus, spotted like the pardalis, pard; *ad*, to; *similis*, like.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—Head streaked white; third or third and fourth primaries edged with white; speculum scarlet, crimson, orange, or yellow; bill strong and short, the mandibles about equal; nasal membrane concealed by plumes.

THE bird does not stay to winter in its breeding haunt, and is away long before sure signs of the coming fall are generally noticeable. Quickly bounding in its flight, it shows the usual methods of the Diamond-bird. Rushing from bough to bough and eucalypt to eucalypt in search of insects, it leads an active life. The same vigour is shown on leaving its lowly-placed nest, for it flies rapidly up into a tree to view the position, hunt the trail of an insect, then sooner or later glide or flutter down to its previously occupied position, perhaps *en route* to spend a moment on a limb close by.

In the search for provender this useful insectivorous bird follows the course of a bough for “scales,” picking up strays and permanents alike. I have watched this bird and the other species all acting similarly in travelling along the stems of saplings, taking off the carapaces and feeding upon the animals within. The remains of Coleoptera and Diptera I have found within the stomachs, although I venture to say this is not the staying point in the wide choice of insect life.

On a clear summer's day you may try to quickly locate the

birds in the high parts of tall timber, but, with slim-bodied animals only 4 inches long, it is not easy. Assisted by their calls and a field-glass you will find them. For a time the little ventriloquists may lead your eyes in all directions, and finally close above you will be seen that for which you search.

Mr. Gould claims that *P. ornatus* has two notes in its call. This sub-species has three, phonetically "pick-it-up," or "wit-e-chu." Occasionally, I believe, there is a hard-sounding trill, the identity of which I am not sure.

Both sexes take part in planning the nest and in the excavation work. While one is labouring at the bowl, the other is expelling the material with its feet, little by little, till finally it is forced out beyond the entrance to the ground below. By quietly approaching the tunnel mouth I saw the process in certain of its interesting stages.

The male either takes part in incubation, or, which is more unlikely, does all the sitting, because, when I cut away the whole tunnel at a later date (4th November, 1893), I found it alone upon the eggs. Within 2 feet of the entrance was a second cave. It was nearly 3 inches in the hard soil, and sufficient only to shelter the non-sitting bird in the night.

The nesting of the sub-species appears to differ from that of *P. ornatus* in so far as feathers are not used as a lining to the nest. Further observation will probably show there is no regular difference.

One nest I found to be cup-shaped, with an irregular and loosely-constructed outer lip. Dry grasses are used internally, and a soft bark in part, specially upon the floor. The whole appears in two portions, the inner being a neat and cup-like body placed down in a loose but regular spherical wall of dried grasses, interwoven and towering concavely above the lip of the inner wall by an inch on one side and 1.5 inches on the opposite one. Height of nest, on one side 3 inches, and

4 inches in the opposing wall. Diameters :—Structure, 4.25 inches x 3.75 inches ; in bowl, 2.25 inches. Depth of bowl, 1.25 inches.

The nest is made to fit in a cavity with domed ceiling in an excavation in the hard subsoil at the end of a tunnel. This tunnel is 10 inches long, and is drilled with a slight upward tendency, as is usual with most ground-boring birds.

The nest entrance in a creek bank is 2 feet below the surface of the ground, some 9 feet above the bed of a trickling stream, though with the stream not immediately below the entrance. By this arrangement the young birds are able to essay their first flight without danger. Judging by the remains of old vegetable matter at the base of the nest, the hollow has been used in a previous year for the purpose of nesting.

The nest appears to me a wonderful piece of architecture, when it is considered that the whole is built in the dark.

Nest.—A rounded structure made of grass and bark, open at or near the top. It is placed at the enlarged end of a drill in the bank of a creek, or in the hollow of a tree.

Eggs.—Three to five, white. Length, 0.65 inch ; breadth, 0.55 inch.

SPOTTED PARDALOTE

(DIAMOND-BIRD),

Pardalotus punctatus, Temm.

Pär-da-lō'tus pungk-ta'tus.

Pardalotus, spotted like the pardalis, pard; *punctatus*, dotted.

PARDALOTUS PUNCTATUS, Gould, "Birds of Australia," fol., vol. ii.,
pl. 35.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7, 9.

KEY TO THE SPECIES.—Head black, with round white spots; back mottled; loreal spot white; under tail coverts yellow; rump chestnut; mandibles about equal, short and strong; nasal membranes concealed by plumes.

THE habitat of this typical "Diamond-bird" is principally in the south and south-east of the continent, while a very close ally, the Yellow-rumped Pardalote, occupies the Mallee country of Victoria.

P. punctatus is a creek-loving bird, performing that service—i.e., destroying insects along the banks—in moist country that *P. xanthopygius* does in the dry, and *P. ornatus* in more open and undulating country. Five species are to be found in the western State.

Both sexes take part in excavating a blind tunnel in the creek bank for their nest, and, like most perching birds, they show a thorough enthusiasm in the work. To find where the species breeds close observation is necessary. It goes to and comes from a hole in the ground that may be owned by any of a dozen other small animals, so undecided are the signs that a bird lives within. Like the other Pardalote members, it tunnels for a few inches on an upward grade, and, enlarging the end for the reception of its dome-shaped nest, cleverly builds in the dark its warm nesting-place, thickly lining it

with grass and bark. Most ground-boring birds are content with the tunnel and a few grass stems only.

When a number of birds were originally collected that had a spotted appearance, and in most other aspects were alike,



Spotted Diamond-bird.

they were all called *Pardalotus* (i.e., spotted), but when a certain *Pardalotus* was found that was genuinely and fully spotted it was specifically called *Pardalotus punctatus* (i.e., spotted spotted). In Australia this is the only really spotted

Pardalote, but in Tasmania there is one having as many as forty spots upon it.

Nest.—A loosely constructed sphere of grass placed at the end of a short tunnel in the much-sloping bank of a creek or hillside, near the water. The position varies considerably.

Eggs.—Four in number, and pearly white. Length, 0.75 inch; breadth, 0.55 inch.

TAWNY FROGMOUTH

(MORE-PORK),

Podargus strigoides, Lath.

Pō-dür'gus strig-oi'des.

Pous (*podos*), foot; *Argus*, hundred-eyed; *strix*, a screech-owl; *eidos*, like.

PODARGUS HUMERALIS, Gould, "Birds of Australia," fol., vol. ii., pl. 3.

GEOGRAPHICAL DISTRIBUTION.—All over Australia and Tasmania.

KEY TO THE SPECIES.—General plumage tawny, streaked and blotched, the male being smaller and much more lightly marked than the female; gape very wide; mouth very much split; nostrils a narrow split near the base of the bill, protected by a membrane and hidden by plumes of feathers; tarsus shorter than middle toe; rectrices pointed. Tail distinctly less than 10 inches; wing more than 9 inches.

BEING nocturnal, this bird has a delicate plumage, assuring for it, as it does for the Owl, noiseless flight. In popular opinion it holds, what is really due to the Boobook Owl, the power of saying "more-pork" or "boo-book," but it has been proved beyond a doubt that the Owl, and not the Frogmouth, says "more-pork." A friend of mine caught one of the former, and, being released one evening, it flew to a

tree, and immediately offered up thanks by saying "more-pork" twice. The call of the Frogmouth is a feeble and unattractive one, except to its own kin. "Oom, oom, oom," repeated about a dozen times, is a simple description.

Of the four Australian species this one is the most widespread, being found throughout Australia and Tasmania.



Tawny Frogmouth. Twilight position.

Until recently it was not known to be in the occident; now it has completed the geographical chain, encircling the continent.

Amongst the various notes I hold on this species I would like to quote those in a letter to me from one of my corre-

spondents, Mr. J. A. Hill. Mr. Hill says:—"On account of its nocturnal habits little is known about it. Certainly it is a most inoffensive bird, and as far as my observation goes lives chiefly on insects and mice. In the daytime it roosts generally on a thick bough with another piece of dry limb over it. The dry limb being of the same colour as the bird, it would be easily passed without being noticed. This at least helps to show that the bird not only knows its own colour, but also the protection afforded by the dry piece of wood above, as Hawks, Magpies, &c., would not dive at it while against the limb. They generally roost in pairs, and in the same place for weeks together. It does not fly until forced by the throwing of a stick or in some other way. The breeding season is about the last week in August or beginning of September. The nest is generally composed of a few green leaves placed in a large fork, often not more than 10 feet from the ground, the fork generally being flat, but sometimes a little slanting. The nest is so shallow that on more than one occasion I have seen the eggs roll out when the bird was disturbed. The eggs are white in colour, and generally two in number, but on one occasion I found three in a nest. It seems to guard its young, for when forced to leave its nest it will sit on a limb near by, snapping its beak very savagely at you. I have frequently heard the note of this species during the day in the breeding season, but it is generally heard just after sundown."

To its *menu* I can add, from personal observation, centipedes, tarantulas, crustaceans, and many hard-winged insects. In fact, they are excellent destroyers of garden vermin, slugs in particular.

The plumage of the bird offers a clear case of protective colouration, the mimicry of the bough on which the bird rests, usually lengthwise, being perfect. On the 19th October 1894, I found a nest containing two grey-downed young, with

the male parent sitting motionless at an angle of 45 degrees to the nest. After a few minutes' watching I noticed its eyelids slowly open as though to see if I had taken my



Nest and Young of Tawny Frogmouth.

departure, and then, but not till then, did the bird reveal a distinctive marking easy of observation in the broad yellow iris. The female was perched parallel with an almost

horizontal bough above me, and so motionless that it was mistaken at first sight for an iguana. However, a weighty stick carefully deposited destroyed the equilibrium of one, and caused a movement of the wings of the other, thus revealing their true nature.

On the 25th November, 1894, a nest was found placed at the junction of three nearly perpendicular limbs—quite an unusual place. The nest was disturbed, and the timid birds deserted it, to the best of my belief for that reason. This consideration has been strengthened by my observations recently in Western Australia.

Nest.—A flimsy structure of twigs that serves the purpose of holding the eggs, effective so long as care is exercised by the bird while flying off and on to it. It is placed on a horizontal fork at varying altitudes in small trees.

Eggs.—Two or three for a sitting; clear white. Length, 2 inches; breadth, 1.4 inches.

ROLLER

(DOLLAR-BIRD),

Eurystomus australis, Swains.

Ū-ris'to-mus âs-tra'llis.

Eurus, wide; *stoma*, mouth; *australis*, southern.

EURYSTOMUS AUSTRALIS, Gould, "Birds of Australia," fol., vol. ii., pl. 17.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 8.

KEY TO THE SPECIES.—General appearance green; bill, legs, and feet red; head and neck dark brown; bill as broad at gape as it is long, culmen rounded. Total length, 10.5 inches; bill, 1 inch; wing, 7.75 inches.

At all times in the southern areas *Eurystomus australis* is an uncommon species, while in southern Victoria there are probably no more than five records of its presence. The Roller is represented in Australia by one species only, and it is one of the few birds that are spread over this continent with which I have had little personal contact.

Mr. John Gould, from observations made in New South Wales, writes :—

"It arrives early in spring, and, after having reared a family, retires northward on the approach of winter. It appeared to be most active about sunrise and sunset. In sultry weather it was generally perched upon some dead branch in a state of quietude. It is a very bold bird at all times, but particularly so during the breeding season, when it attacks with the utmost fury any intruder that may venture to approach the hole in the tree in which it has its eggs.

"When intent upon the capture of insects it usually perches upon the dead upright branch of a tree growing beside and overhanging water, where it sits very erect till a passer

attracts its notice, when it suddenly darts off, secures its victim, and returns to the same branch. At other times it may constantly be seen on the wing, mostly in pairs, flying just above the tops of the trees, diving and rising again with many rapid turns. During flight the silvery white spot in the centre of the wing shows very distinctly, and hence the name of Dollar-bird bestowed upon it by the colonists.

“It is a very noisy bird, particularly in dull weather, when it often emits its peculiar chattering note during flight.”

Nest.—In the hollow of a tree, with decayed wood as a floor.

Eggs.—Two or three in number; white, rather glossy, and sometimes variable in form, some being oval and pointed, others being round (A. J. North). Length, 1.45 inches; breadth, 1.05 inches.

BEE-EATER,

***Merops ornatus*, Lath.**

Mer'ops or-na'tus.

Merops, a bee-eater; *ornatus*, adorned.

MEROPS ORNATUS, Gould, “Birds of Australia,” fol., vol. ii., pl. 16.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 8, 9.

KEY TO THE SPECIES.—Green mantle; a broad black patch on the fore-neck; tail black, the centre feathers, which are elongated, washed or edged with blue; bill long, culmen sharply ridged; feet syndactyl.

BEE-EATERS are surely dangerous-like birds to the apiarists. To a small extent this is so; and we nearly always find an element of evil in the so-called good! Briefly, I may state a case in their favour, because, while the bee-keeper is likely to

suffer a little, the cultivators of the soil benefit much. Go to their nests when the callow young are in them, and in the majority of cases you will find an exceedingly large number of insects (not bees) awaiting home consumption. Previous



Bee-eater.

to this they are either on trees perched in anticipation of a beetle or fly passing that way, or are in pursuit of it. It makes short incursions from a branch, returning to the same

place or one near by. It is one of those birds that come into Northern Victoria about October of each year, and go out nearly the same way as they came, in January or February.

The birds associate in small flocks, and their elegance and beauty make them general favourites whenever they are seen beyond the close environment of bee-farms. It is all over Australia, and is a world-wide form, our one being the Australian species, and the only species known on this continent. In its nidification it is very much like the Kingfishers, tunnelling holes for nests and laying white eggs. Mr. Arnold says:—"The Spaniards, who eat all sorts of little game, with no regard for plumage or habits, capture bee-eaters at night by going round and pouring water into holes in banks and trees where they roost, at the same time holding a net over the entrances, into which the affrighted birds speedily dart." These people pay a penalty for every bird destroyed. It is rarely seen so far south as the latitude of 37 degrees.

Nest.—A tunnel in flat or rising ground, or in the bank of a watercourse ; no vegetable nest at the end.

Eggs.—Five to the clutch ; pearly white. Length, 0.8 inch ; breadth, 0.7 inch.

SPOTTED NIGHTJAR,

Eurostopus argus, Hartert.

Ū-ro-s'to-pus ä'r'gus.

Eurus, wide; *osteon*, bone; *pous* (*podos*), foot; *Argus*, hundred-eyed.

EUROSTOPUS ARGUS, preserved and mounted specimens in the States' Museums.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 8, 9.

KEY TO THE SPECIES.—Freckled grey and brown; large white patch at side of neck; abdomen and under tail coverts uniform rusty-brown; mouth is deeply cleft and gape is very wide; wing less than 9 inches, tail $6\frac{1}{2}$ inches.

FOUR species of these nocturnal birds are to be found in Australia. It is remarkable that in the case of two species—the one under consideration and *E. albigularis*—the plumages vary with the nature of the soil amid which the birds live, and there is so strong a likeness in the two that, according to Mr. Hartert, an English nomenclator, for purposes of identification measurements only can be taken as a safe guide. The wings of the Spotted Nightjar are less than 9 inches in length, whilst in the case of *E. albigularis* they are more than 9.5 inches.

A third species is *Caprimulgus mucrurus*,^{*} Hors., distinguished by having the four outer primaries spotted white and the wing $7\frac{1}{2}$ inches in length. The fourth species is the Owlet Nightjar, specially referred to on the following page. In appearance all these birds are miniature "Moreporks."

During the day the Spotted Nightjar may be found upon the ground, or close to it, reposing in slumber, but with the waning of the light and the oncoming of twilight its movements while hawking for insects are particularly rapid and stealthily silent. Judging by the scarcity of the bird in the southern latitudes during the winter, I am of opinion that

it goes north at this season to get the advantage of the warmer climate and, consequently, more abundant insect food.

Like nearly all the night-flying birds, the Spotted Nightjar is beneficial to man, taking up, as it does, the battle against insect pests as other insectivorous birds are retiring from the field for the night and insuring a constant warfare being maintained against these orchard and garden enemies. Grasshoppers, beetles, and soft-bodied insects are generally to be found in the stomachs of dissected specimens.

Nest.—Simply the ground, and in close relation to a stone, &c., to serve as a partial breakwind.

Eggs.—One only for a sitting; of a uniform light olive-stone colour, with here and there a roundish purple blotch or spot (A. J. Campbell). Length, 1 inch $5\frac{1}{2}$ lines; breadth, 1 inch $1\frac{1}{2}$ lines.

OWLET NIGHTJAR,

(LITTLE MOREPORK),

***Aegotheles novæ-hollandiæ*, Lath.**

Ēgö-the'les nō-vē-hol-an'di-ë.

Aigos, a goat; *thacin*, to suckle; *novæ-hollandiæ*, of New Holland.

ÆGOTHELES NOVÆ-HOLLANDIÆ, Gould, "Birds of Australia," fol., vol. ii., pl. 1.

GEOGRAPHICAL DISTRIBUTION.—The whole of Australia and Tasmania.

KEY TO THE SPECIES.—Mouth very much split; gape very wide; two stripes on brown head and two crescents on hinder part white; back, rump, upper wing coverts and upper tail coverts deeply vermiculated with pale grey; tail barred; wing quills grey marbled and spotted; lower parts whitish, with dusky vermiculations. Total length, 8.5 inches. Some specimens show a rufous tinge over the body.

THE Owlet Nightjar is a member of the weak-footed order of birds, and though resembling the Owls in its nocturnal habits and general appearance, is opposed to this group in so far as the latter belong to the strong-footed order. The Owls depend to a large extent on their talons for the capture of their prey, whilst their smaller insectivorous relative trusts to its wide mouth, which, when opened to its fullest extent, as the bird flies noiselessly and rapidly along, presents a formidable trap to any insects that may be flying within its reach during the night.

Mr. Gould writes of this species:—"During the day it resorts to the hollow branches, or spouts, as they are called, and the boles of the gum-trees, sallying forth as night approaches in quest of insects, particularly small Coleoptera. Its flight is straight, and not characterized by the sudden turns and descents of the *Caprimulgi*" (*i.e.*, the previous species). "On driving it from its haunts I have observed

it fly direct to a hole in another tree. When assailed in its retreat it emits a loud hissing noise, and has the same stooping motion of the head observable in Owls; it also resembles that tribe of birds in its erect carriage, the manner in which it sets out the feathers round the ears and neck, and in the power it possesses of turning the head in every direction, even over the back—a habit it is constantly practising. A pair I had for some time in captivity frequently leapt towards the top of the cage, and had a singular mode of running or shuffling backwards to one corner of it.”

The usual mode of ascertaining the presence of this bird is by sharply tapping the base of hollow trees with a stone or tomahawk. If this be done energetically, the little inmate will almost invariably ascend to the outlet and peep over to ascertain the cause of the disturbance so near its home. If the tree be a lofty one, and no immediate further disturbance occur, it will very likely retire to its hiding place at the bottom of the hollow; but should the tapping be repeated, it will fly a short distance to a place of greater security.

Nest.—Simply the dust in a hollow of a tree, a few inches down the trunk.

Eggs.—Three or four to a sitting; white. Length, 1 inch; breadth, 0.85 inch.

PALLID CUCKOO

(SEMITONE OR SCALE-BIRD),

***Cuculus pallidus*, Lath.**

Ku-ku'lus pal'id-us.

Cuculus, a cuckoo; *pallidus*, pale.

CUCULUS INORNATUS, Gould, "Birds of Australia," fol., vol. iv., pl. 85.

GEOGRAPHICAL DISTRIBUTION.—The whole of Australia and Tasmania.

KEY TO THE SPECIES.—General appearance grey; eyelash yellow; tail barred with white and fan-shaped; wing reaching beyond tail coverts; feet zygodactyl.

EXCLUDING the winter season, the Cuculidæ are always to be found in the southern portions of our continent, though even during the cold weather solitary birds may be seen, who have not followed their migratory habit of seeking the warmer northern regions.

In early September the voices of two species may be heard, distinctly rising above the universal chatter that heralds the approach of spring. Of the 12 Australian Cuckoos, 6 annually come to the south.

Altogether some 180 species of Cuckoos are known to science, divisible under the following three heads:—(a) True Cuckoos (Cuculinæ), (b) Lark-heeled Cuckoos (Centropodinæ), (c) Bush Cuckoos (Phœnicophœinæ). (a) is universal; (b) is tropical—example, the Spur-footed Cuckoo of Queensland; (c) is unrepresented in the Australian region. The largest of our mainland Cuckoos (*Centropus phasianus*, Lath.) measures 24 inches in length, and is the only non-parasitic species, while the smallest (Bronze Cuckoo) is $5\frac{1}{2}$ inches, and, like all the others, is parasitic.

Australian Cuckoos—or Cuckows, as Professor A. Newton prefers to write it—do not announce their arrival as do their

The Fan-tailed species and two Bronze species choose 75 per cent. of dome-shaped nests, while the Square-tailed species is content with 50 per cent. and the remaining half of open nests. Because Tits are so thoroughly insectivorous and obliging, they act in the majority of cases as foster-parents.

The mature Cuckoo is supposed to be the only bird that eats hairy caterpillars, though, if I mistake not, one of the birds lately introduced to our shores also affects this diet. At the same time it probably holds the distinction of being the only insectivorous bird which lays 20 eggs in a season, yet, on account of the enormous waste, such as destruction of eggs by other birds, laying in old nests, and other unfortunate occurrences incidental to a parasite life, their numbers never reach abnormal dimensions. However, those that do appear should receive complete protection, if only on account of their hairy caterpillar devouring proclivities.

The dates of the arrival of *C. pallidus* from Queensland into southern Victoria were, according to my notes, the 1st of September in 1896, the 12th of August in 1897, and the 20th of August in 1898. These Cuckoos start to call at daybreak (5 o'clock), and the Bronze and Pallid species disturb the peace in the hours before and after midnight. I have more than once left a cosy fire at 10 p.m. to investigate the strange sounds.

The call of the Ash-coloured Cuckoo (*Cacomantis flabelliformis*, Lath.) is a high-pitched, hard-sounding trill, given as if the bird were in trouble and seeking someone it had lost. It gives me the impression that the meaning of its generic name—"prophet of ill"—was applied as if it had a direct bearing on the voice. It is certain the birds of the neighbourhood do not like it. As my friend, Mr. Graham, has made a fuller observation, I quote from one of his letters as follows:—"On the 30th August, 1897 (eighteen days after the arrival of the Cuckoo into the Cape Otway district of Victoria)

a pair of Scarlet-breasted Robins attacked an Ash-coloured Cuckoo, alighting together upon its head and back. They worried it for half a minute, the Cuckoo not caring much, judging by appearances. When it flew away to catch a grub



Ash-coloured or Fan-tailed Cuckoo.

several Yellow-rumped Tits took offence at its presence and offered fight. Flying to a green tree, it was then beset by a White-shafted Fantail. From there it flew to the ground, amongst the ferns (*Pteris*), outside the slab fence. I could

not see it, but by the loud commotion among the Scrub-Wrens (*Sericornis*) it evidently was not welcome. Having risen again, it was attacked by the Sordid Wood-Swallow in force, and driven off. During the series of attacks it offered no defence, seemingly occupied alone in the search for its daily food."

The following dates give the arrivals of three species of Cuckoos on two near latitudes for the respective seasons :—

BRONZE CUCKOO (*Chalcococcyx plagosus*, Lath.)

	1895.	1896.	1897.
Box Hill, Vict.	.. 25th July	.. 24th July	.. 26th July
Heytesbury, Vict.	.. —	.. 27th Sept.	.. 21st Sept.

ASH-COLOURED CUCKOO (*Cacomantis flabelliformis*, Lath.)

	1895.	1896.	1897.
Box Hill, Vict.	.. 14th Aug.	.. 5th Aug.	.. 1st Aug.
Heytesbury, Vict.	.. 28th Aug.	.. 12th Sept.	.. 12th Sept.

PALLID CUCKOO (*Cuculus pallidus*, Lath.)

	1896.	1897.
Box Hill, Vict.	.. 1st Sept.	.. 12th Aug.
Heytesbury, Vict.	.. 29th Sept.	.. 26th Sept.

The scanty figures given show that the Pallid species arrives between two and four weeks later than the Fan-tailed and Bronze species, and that the arrival of the same species at the Heytesbury district, according to my correspondent, is one or two months later. I presume that Box Hill is upon the migratory course from the north-east, and that the Otway-Heytesbury district is the terminus, except for those that go further west or cross the strait to Tasmania. The dates of arrival appear to be fairly uniform in each year. It would be interesting to learn when Cuckoos leave Queensland for the south, and the time they spend in New South

Wales. How far the birds of south-west Australia go north we have yet to learn.

Nest.—This species being parasitic, it has no nest of its own, but places the egg in one or other open nest of an insectivorous bird, such as the Robin or Fantail.

Egg.—One in a nest: pale salmon colour, generally uniform, but sometimes with odd spots of chestnut upon it. Length, 1 inch; breadth, 0.75.

BRONZE CUCKOO,

***Chalcococcyx plagusus*, Lath.**

Kal-co-kok'siks plā-go'sus.

Chalkos, bronze; *kokkux*, a cuckoo; *plaga*, a stripe; *ous*, denoting “presence,” fulness.

CHRYSOCCOCYX LUCIDUS, Gould, “Birds of Australia,” fol., vol. iv., pl. 80.

GEOGRAPHICAL DISTRIBUTION.—The whole of Australia and Tasmania.

KEY TO THE SPECIES.—General appearance bronzy; the under surface clearly barred; crown and back of neck dark violet-brown; basal half of tail never uniform rufous; no rufous edges to quills and with little rufous on under surface of wings and outer pair of tail feathers. Total length, 6.25 inches; wing, 4 inches; tail, 3 inches.

Two species of Bronze Cuckoos, having a close resemblance to one another when on the wing, inhabit the same district, and may even be found in the same paddocks. The Rufous-tailed or Narrow-billed species differs from *C. plagusus* in the possession of a narrower bill and in having the basal two-thirds of the tail rufous. It also lays a pink-spotted egg in contrast to the bronze egg of *C. plagusus*.

I found an egg of the latter species in a nest of the Yellow-

tailed Tit on 24th July, 1896—the earliest find I have had the fortune to make, due probably to the very mild winter of that year, though the familiar calls of the birds were not heard by me until some time after this date. The latest egg observed



Bronze Cuckoo.

Upper figure, young ; lower figures, adults.

was on 9th of January, 1897, also in a Yellow-tailed Tit's nest, and I found a young bird as late as 1st March, 1897, by which date, contrary to the usual habit, the birds had not migrated northwards.



Young Narrow-billed Bronze Cuckoo being fed by foster-parent, Blue Wren.

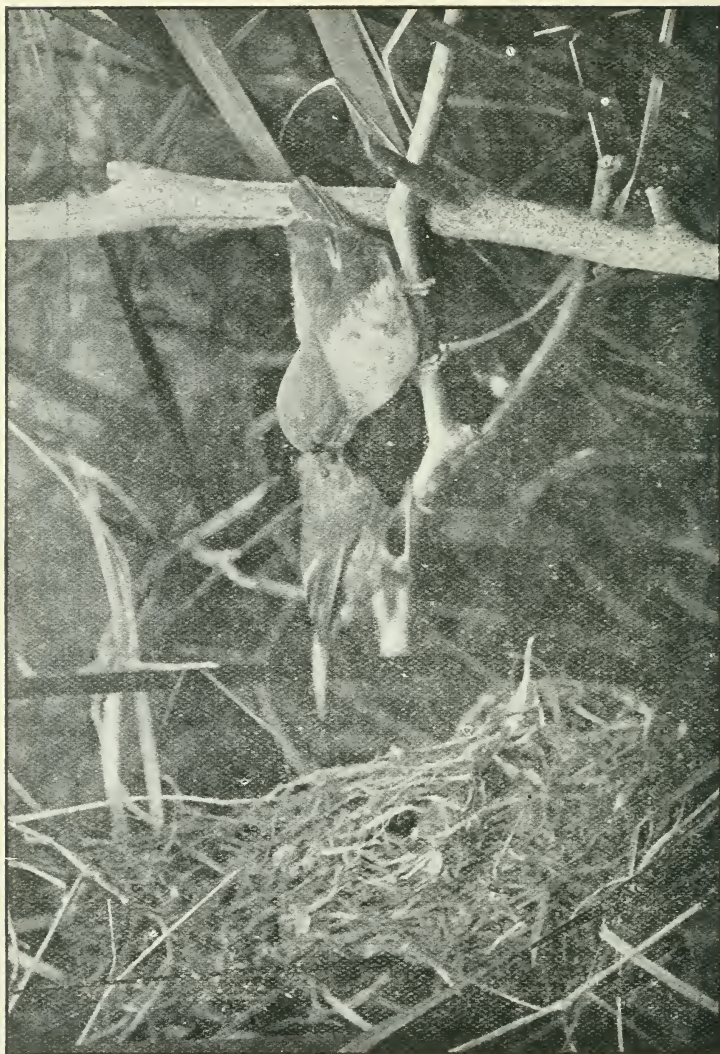
Human qualities may be found in the Bronze Cuckoo as in other birds, showing the proof the proverb—"One touch of nature makes the whole world kin." Early one September I noticed three birds seated upon the same bough. As I watched them, one flew to the ground, upon which the remaining two became, human-like, very frivolous. Suddenly one left the bough in pursuit of an insect, caught it, returned, and generously offered its capture to its waiting companion. This very sensibly was accepted by No. 3 in the same spirit as it was offered; thereupon the bird on the ground, as though jealous of the proceedings above, refused to return to the bough, and the group dispersed.

Small birds, such as the Blue Wren and the various Tits, naturally exhibit strong objections to the harassing attentions of the Narrow-billed Bronze Cuckoo. On the 25th of December, 1894, I observed an egg of this species under the inner lining of the Striped Ground-Tit's nest (*Chthonicola sagittata*). The Ground-Tit evidently had covered the egg to prevent incubation. On another occasion I took from the upper chamber of the Yellow-tailed Tit's nest, usually occupied by the male of this species, a fresh Cuckoo's egg whilst below in the incubating chamber were three young Yellow-tails. The upper room was also domed, with side entrance, and I fear the Cuckoo was as much deceived by this parlour as the fly of the proverb was with the spider's. A third peculiar case noticed by myself was a Cuckoo's egg upon the ledge of the nest of the White-fronted Chat (*Ephthianura albifrons*), 18th December, 1895, while within were two quite naked young and one egg. Did the Chat push this egg on to the ledge?

I received recently two eggs of the Narrow-billed Bronze Cuckoo from Swan Hill, which had been taken from the nest of *Xerophila leucopsis*, along with five eggs belonging to the rightful owner.



Young Fan-tailed Cuckoo in nest of Brown Tit.



Young Bronze Cuckoo being fed by Brown Tit.

Dr. Rey, in *Nature*, remarks that such an example is a sign of the colonizing instinct, and upon his theory, these eggs being differently marked and with various colour density, they belong to different females. The theory is said to have been exploded.*

Bronze Cuckoo's eggs have been found in the nests of 22 species of birds, and at the present moment there is the interesting point to be settled whether the insect-eating Diamond-bird (*Pardalotus assimilis*) is not also a foster-parent. It is not usual to place an egg 12 inches down a hollow; for how would the young Cuckoo turn out the proper young of the nest? This interesting question will need time and observation to settle. Yet the Cuckoos' eggs have been found in an equally unpropitious situation—viz., in the nest of the Tree-creeper at the bottom of a hollow trunk.

The foster-parents are all insectivorous birds with one exception—Red-browed Finch—but as this species feeds its young on soft insects during the season, for practical purposes it might be classed among the insect-eaters. Robins, Wrens, Chats, Tree-runners, and Tits (chiefly the last) pilot the egg and young through their early stages.

Recently, in Victoria as well as in England, photographs have been made of a young Cuckoo in the act of expelling the other young by placing its shoulders under each and lifting them overboard one at a time.

In three birds obtained in the same number of months of 1897 I noticed the following differences:—(a) March: a large proportion of brown in the plumage. Presumably this is a very young bird. (b) August: the wings coverts tipped with brown have disappeared, and the barred markings of the

* See *Emu*, vol. vi., part 2. "Parasitical Habits in the Cuculidæ," C. L. Barrett.

breast are dentate, nearly as in (a). (c) September: the dentate markings are now transverse parallels, and are not so heavy as in (a) and (b). It seems to me the stage (b) is a one-year-old, while (c) is matured or two years old. The presence of bars or stripes on the under surface seems to denote the meaning of *plagossus*.

Nest.—Being parasitic birds they use other birds' nests. This species places one egg in the nest of a Tit principally.

Egg.—One to a nest; occasionally two will lay one each in the same nest; uniform bronze colour. Length, 0.65 inch; breadth, 0.5 inch.

PIPIT

(GROUND-LARK),

***Anthus australis*, Vig. and Hors.**

An'thus às-tra'lis.

Anthus, a small bird; *australis*, southern.

ANTHUS AUSTRALIS, Gould, "Birds of Australia," fol., vol. iii., pl. 73.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7, 8, 9.

KEY TO THE SPECIES.—General plumage tawny, exceedingly dark in some cases and very light in others; outer tail feathers white, without any brown on the outer webs; second, third, fourth, and fifth primaries distinctly emarginate; minor secondary quills nearly as long as the primaries; bill slender, the profile of the culmen swollen from centre to tip.

OUR Meadow Pipit is so well known that it scarcely needs more than a passing mention. But for the benefit of those who are not conversant with its habits I offer the following observations:—The Pipits differ from the Larks in some particulars. The bill is not only more slender than that of

the Lark, but the characteristic notches in the bill of the former are absent from that of the latter. The hind part of the tarsus also is not divided into plate-like surfaces as with the Larks. Thus, though in the vernacular this bird is termed a



Pipit.

Ground-Lark, it is not a Lark at all, its more appropriate title being Pipit.

Anthus australis is a true ground bird, for not only does it invariably build its nest on the ground, but it spends the

greater part of its life thereon, seldom essaying flight for more than a few seconds at a time. When disturbed by the presence of some intruder it seeks safety by running swiftly along the ground, dodging in and out among the tussocks and long grass, and occasionally coming to a full stop for a moment to cast a swift glance around; then, if the pursuit be maintained, it will rise suddenly, fly to a distance of a hundred yards, and again alight on the beloved earth, only to resume its former tactics. As a matter of fact, it is the Pipit's golden rule to escape from danger by running rather than to betray its presence by flight. Should the bird wish to enter an adjacent paddock and be compelled to pass houses *en route*, it will rise quickly, fly high, and fall as rapidly upon the new pasture on the other side. A direct flight of, say, 25 yards will occupy about five seconds, while a run in a straight line of 15 yards will take approximately the same time.

If a quarrel arise between a pair of these birds, a long, rapid, and ziz-zag flight follows, little in accord with the usual short, unventuresome flight.

The congregations of this bird in the season when most species agree to associate are seldom more than ten or twelve in a flock. At other times the pairs, by themselves or with their young, are seen by daylight almost in any green or brown field, or may be heard at nightfall, when other birds are making straight for home by all the rural short cuts known to them. Wherever a dry channel offers itself the bird will use it for escape by running, and in this way I noticed, some time ago, a young White-fronted Chat trying to evade observation and make its escape. Both this bird and the Pipit feign an injury or youthful weakness to distract one's attention from the nest of eggs or young that the parent birds have been forced to leave owing to an intruder's presence.

Contrary to the habit of the Grass-Warbler, which runs some distance from the nest before taking to flight, the Pipit, if suddenly disturbed, will rise direct from the nest, so that the discovery of the latter is an easy matter, as many birds



Young of Pipit (Ground-Lark) in nest.

unfortunately find to their cost. Were it not for this habit of the bird the nests would be very difficult to find, for, in addition to being of small size, they are most artfully built in

a shallow depression caused by the pressure of the hoofs of cattle, or in a slight depression beneath a tuft of grass.

The young are early models of the old. Before leaving the saucer-shaped nest of grass material, the outer two rectrices are white, each with a central longitudinal dark line, and this before these feathers are an inch in length. The little birds early learn to catch the worms which appear so plentifully after a heavy rainfall.

Associated with the Pipit in the field is a Bush or Thick-billed Lark (*Mirafr*), and so much are they alike that it is difficult to distinguish between the two. The *Mirafr* has a stouter bill and is shorter in the body. The food of the Pipit is ground-living animals, as worms and beetles (*Scarabidæ*), also seeds of grasses.

Nest.—Terrestrial, cup-shaped, and placed in a hollow caused by cattle hoofs, or in a slight depression beneath a tuft of grass; made of dry grasses, not always exposed as in the illustration.

Eggs.—Three to the clutch; brownish-white, with blotches and spots varying in the intensity of brown. Length, 0.9 inch; breadth, 0.6 inch.

QUEEN VICTORIA LYRE-BIRD

(NATIVE PHEASANT),

Menura victoriae, Gld.

Mē-nū'rū vik-tor'i-e.

Mene, the crescent moon; *oura*, a tail; *Victoria*, a proper name.

MENURA SUPERBA, Gould, "Birds of Australia," fol., vol. iii., pl. 14.

MENURA VICTORIÆ, mounted specimens, States' Museums.

GEOGRAPHICAL DISTRIBUTION.—Area 4.

KEY TO THE SPECIES.—Tail feathers of extraordinary length, and lyre-like, many devoid of hooklets: outer tail feather white below, bars being chestnut; under tail coverts ashy; back ashy-brown. Female has a less singular tail.

OF the many wonderfully-formed animals in our country this is perhaps the most beautiful. Its tail alone would form an emblem worthy of the country. The genus, of which there are three species, confines itself to dense and humid country of Queensland, New South Wales, and Victoria. One species alone is found in Victoria, a second in New South Wales, and a third, with the second extending its range, in Queensland. While Victoria has two conspicuous classes of country it has two species of so-called "Native Pheasants," one the "Mallee Pheasant," and the other the "Gippsland Pheasant." Neither belongs to the true pheasants, being known as such in the vernacular only. The difficulty of observation of Lyre-birds is particularly great. One needs to travel comfortably to the confines of the heavy, boggy, and thoroughly wet timber, and then, to study the natural economy, the labour begins. The forcing through matted vegetation and slimy logs has to be done noiselessly, as the bird is seldom, if ever, pleased with any trespass on its haunts. So shy is its disposition that when you have accidentally broken a twig, after treading



Queen Victoria Lyre-bird (male).

carefully upon at least 50,000 during the half-hour's approach, away goes the male bird like a flash of lightning. You move on again in the full possession of what is left of your self-control after two or three attempts to see the "Mocking-bird of Australia" on its playground. However, a view of the playground eventually shows you it is a small cleared space of about three feet square in the tangle of twining vegetation. It is made of raised ground, kept fairly well weeded by the constant use the male makes of it while dancing to please its mate, in the winter time especially. It is at this period of the year many of the animals in its neighbourhood are mocked in turn. Mr. A. J. Campbell writes very truly of this bird when he characterizes its vocal powers in the following way : — "The powerful, sonorous ring of the Lyre-bird's natural song is not surpassed by any of its Australian compeers ; as to its mocking capabilities, it certainly leaves all the world's mocking-birds far behind.* Its ear is so accurate that it can imitate to the very semitone the vocality of any of its forest friends, whether the solemn 'mo-poke' of the Owl, the coarse laugh-like notes of the Great Brown Kingfisher, or the higher pitched and more subdued notes of smaller birds. But the most extraordinary performance is the imitating, not a single bird, but a flock ; therefore it has to produce duplex or double-sounding notes. I have heard it imitate simultaneous sounds exactly like the voices of a flock of Pennant Parrakeets rising from the scrub. It is equally at home with other familiar sounds ; the grunting of the Koala or Native Bear, the barking of the selector's dog, the noise of the splitter's saw, or the clinking of his axe against the metal wedge, all alike are perfectly reproduced in the throat of this most singular feathered mimic." Now, the question, raised possibly

* Dr. Shufeldt champions the cause of the Mocking-bird (*Mimus polyglottus*) of North America.



Nest of Queen Victoria Lyre-bird.

for the first time, is whether this is a mocking-bird in the true sense—vocally, not anatomically? I give the substance of a letter to me by Mr. T. W. De Lany:—“The Lyre-bird is generally thought to be a mocking-bird, but after quite twenty years amongst them I am of the opposite opinion, as I never heard them imitate anything whatever beyond the ordinary round that they all have, and every one exactly alike. The notes of the birds that they use, in my opinion, have been acquired many ages ago, when their ancestors were imitators, and have now become set and hereditary. A friend of mine years ago had a young cock bird, and although it was taken from the nest, and never had an opportunity of hearing other birds, it whistled the same as those in the scrub. At the time I did not quite believe it, but since I do. Only yesterday I was out looking for Wonga Pigeons, when I shot a yearling Lyre-bird, with a tail the same as a hen, and it was whistling just as any old bird does on his dancing heap.” On this matter I should be glad to have expressions of opinion. My own is, the male inherits a series of notes and quickly learns more with the opportunity. The Buln-Buln, as it is sometimes called, is protected from damage by Act of Parliament, and rightly so, because of its insectivorous habits and natural unique structure. The food varies between insects and very lowly organisms; snails and crustaceans help to support it. Although not a frequenter of the gardens of pioneer settlers in our wilds of heavy rainfall, it is closely associated with the surroundings. Maize, potato, and other crops that flourish in moist lands all benefit indirectly by the services of this bird. The nesting is peculiar to the bird. A heavy dome-shaped mass of strong twigs is placed on the ground, on a stump, or 15 feet up in the fork of a tree in the quiet of a glen. The inner part of the nest is made of fibres. The entrance overlooks a small expanse of air, so that the sitting hen may easily soar away from it. If the single egg in the nest is

touched by a human being it is at once deserted, the case being a parallel one with that of the Black Duck. Mr. De Lany, quoted above, tells me the period of incubation of one egg noticed by him was 8 weeks and 1 day. This is a surprisingly long time. The reference made here to Gould's coloured figure of *M. superba* will serve to direct you to the nearest resemblance to *M. victoriae*. There is no good plate of the latter species available for inspection.



Queen Victoria Lyre-bird on its Dancing Mound.

Nest.—The description is due to the observations of Mr. Campbell. “The inner or proper nest is constructed of the dark-brown wiry and fibrous material of tree-fern trunks and other fern rootlets closely matted together and interwoven with stringy leaves, moss, sand, &c., the inside bottom being lined with the bird's own breast feathers. It is oval, about twice the size and same shape as a modern football, with an

end lopped off which serves for a rounded side entrance. This inner nest is embedded in an anterior or outer nest composed of large sticks and twigs, resembling that of an eagle, with spouted platform or landing-place at the entrance. The roof of the inner nest is also protected with sticks, and over the whole structure are often artfully thrown a few dead or green fronds and other vegetation. The dimensions of different nests do not vary much. The following are sizes of one which I took on the spot. It was situated in a gully, on a slight eminence consisting of a fallen tree-fern trunk with other *débris*. So cunningly was it hidden that it was undiscoverable from behind to a person not two paces off; but the front, which betrayed it, commanded a good outlook down hill. Over all, height, breadth, and depth were 2 feet each way; through diameters (*i.e.*, length and breadth) of interior nest, 1 foot 3 inches across; inside or egg cavity, from wall to wall and from roof to floor, 10 inches each way; and from entrance to back wall 1 foot 1 inch. The ragged, spouted platform or landing-place extended 5 or 6 inches beyond the entrance. The egg, which was hidden by the feathers, lay at right angles with the entrance, and measured 2 inches 5 lines by 1 inch 8 lines."

Nest.—Described above. Bulky, side entrance, sticks and rootlets.

Eggs.—One to a sitting. The ground colour may vary between purple and brown; the smudges and spots are much like the ground colour, but appear as if above and below the surface; texture of shell rough. Length, 2.5 inches; breadth; 1.5 inches.

BUSTARD

(PLAIN-TURKEY).

Eupodotis australis, Grey.

Ū-pō-dō'tis ās-tra'lis.

Australis southern; *eupodia*, strength or speed of foot; *otis*, bustard.

OTIS AUSTRALASIANUS, Gould, "Birds of Australia," fol., vol. vi., pl. 4.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 8, 9.

KEY TO THE SPECIES.—Feathers of the neck and forehead elongated; a black patch across the chest and the sides of it; greater wing coverts ashy-black, with a white spot at the end; bill flattened and obtuse. Total length, 48 inches.

THIS, the sole representative of the Bustard family in Australia, is, geographically speaking, an isolated species, the Malay Archipelago and the adjacent Asiatic mainland, which do not possess any member of this group, dividing it from its nearest relative, an Otis of India.

Up to a recent date the so-called Turkey was to be found in considerable numbers in Southern Australia, particularly along the banks of the River Murray, but advancing civilization and the merciless warfare waged against them have so far reduced their numbers that now they are rarely seen in this district. It seems beyond the powers of the average man who possesses a gun to resist the temptation to shoot every Turkey that comes within gunshot, despite the law that protects them, and in defiance (or perhaps in ignorance) of the immense services rendered to growers by these birds.

There is little doubt about the fine quality of a roast Bustard, yet a dish of this kind demands a heavy price for its enjoyment; for the death of even one such voracious eater of ground vermin—grasshoppers, &c.—as the bird has proved itself to be, is a loss of many pounds sterling to the rustic

community. It were wise, indeed, to allow the poor few remnants of this once numerous species to wander unmolested, in hope that they may increase and multiply, to the benefit of mankind. During a recent visit to Western Australia I became aware of the fact that the Bustard is being recklessly destroyed in that State much in the same manner as occurred in the eastern States twenty years ago. I was informed that in one district 84 birds had been killed during December, 1899. Could we but foresee the consequences of this murderous extermination—viz., a great deal of expensive labour protection over crops that might be more effectively accomplished gratis by the Turkey—we should see that our protective legislation is honoured in the observance by sportsmen and officials alike.

Like the Gulls, Rails, and Quails, young Bustards leave their nests almost as soon as they are hatched, and wander over the ground, secure in the guardianship of protective colouration, until the wings have sufficiently developed to allow of flight. In this respect they differ from young Mallee-Fowl (Mound-builders) which can fly soon after leaving the nest.

Recently on a New Zealand steamer two Mound-builders' eggs hatched out on a cabin table during the steamer's passage to Australia, and, without a moment's hesitation, one of the precocious youngsters flew across the cabin, so great was the development of its wings even at this stage.

Nest.—Simply a slight depression in the ground.

Egg.—One to a sitting; olive colour, with long brown smudges upon it. Length, 3 inches; breadth, 2.2 inches.

STONE PLOVER

(LAND CURLEW),

Burhinus grallarius. Lath.

Bu-rhi'nus gra-la'ri-us.

Burhinus (?); *grallæ*, stilts.

ŒDICNEMUS GRALLARIUS, Gould, "Birds of Australia," fol., vol. vi.,
pl. v.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 8, 9; accidental in
5 (W. V. Legge).

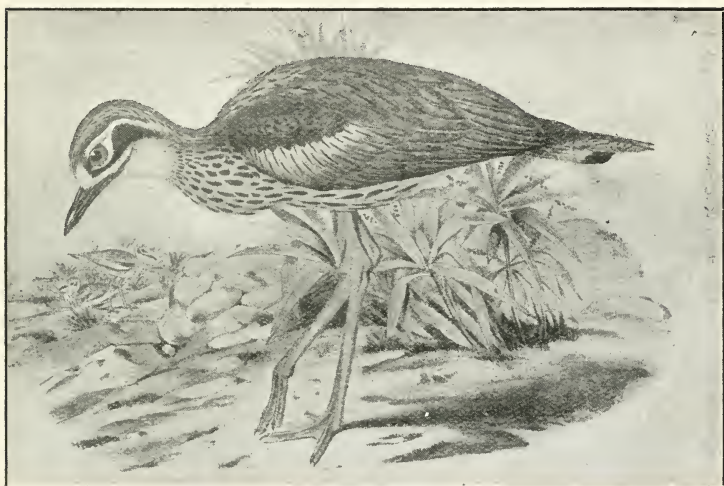
KEY TO THE SPECIES.—Upper surface ashy-grey, much streaked; lores,
narrow eyebrow, and a spot below eye white; black and rufous
line across the eye and ear coverts; cheeks reddish-brown; hind
toe absent; bill shorter than head, apical portion swollen and
forming marked dertrum, the apical curve of genys ascending
gently. Total length, 20 inches.

THIS long-legged bird, like the Plovers, is generally to be
found on the ground, but, unlike the latter birds, who prefer
the plain, it frequents either the timbered country or the
grassy open spaces to be found intersecting this class of
country.

The weird, melancholy call of this bird, interpreted "wee-
loo" or "cur-loo," may often be heard at night by those who
visit its haunts. It is not a nocturnal bird in the same sense as
the Owl or Morepork, though it feeds at night as well as
during the day; it rather resembles the ducks, geese, and
waders in general, who often move about from one spot to
another after nightfall.

The Stone Plover presents a stately appearance as it struts
majestically across a plain, ever and anon casting furtive
glances around in search of enemies. Should it be disturbed
this strut is changed to a rapid run, defying the efforts of any
ground pursuer to outpace. At other times, in order to elude

its enemies, it will resort to its power of mimicking the surroundings. Suddenly coming to a full stop, it will crouch down, assuming a rigid form in almost any peculiar position, and remain very quiet until the danger has passed. Its colour so closely simulates the surroundings that in the various attitudes it assumes it may be mistaken for a rock, a dry tussock, or a log of wood, and so possesses a remarkable power of self-protection.



Stone Plover.

Hawks are the natural enemies of the Stone Plover, and it is specially against them that they must ever be on guard and use all their powers of mimicry. Sportsmen know well how difficult it is to approach within gunshot of these birds and how easy it is to lose sight of them. As a general rule they associate in pairs only; sometimes six or eight, or even as many as fifty, may be seen in a flock during the winter.

The food comprises insects, ground fruits, and sundry ground vermin.

In the same district, and even in the same field, may be found two small species of Plover—the Spur-winged and the Plain Plover.

Nest.—Simply the bare ground in lightly-timbered country.

Eggs.—Two to a clutch. They are subject to much variation in the ground colour between a light and dark stone, both having brown spots and irregular blotches upon them to a greater or less degree. Length, 2.2 inches; breadth, 1.6 inches.

WHITE-FRONTED HERON

(BLUE CRANE),

Notophoyx novæ-hollandiæ, Lath.

Not'o-foix nō-vē hol-an'di-e.

Noton, the back; *phoxos*, tapering to a point; *novæ-hollandiæ*, of New Holland.

ARDEA NOVÆ-HOLLANDIÆ, Gould, "Birds of Australia," fol., vol. vi., pl. 53.

GEOGRAPHICAL DISTRIBUTION.—Areas 1 to 9 inclusive.

KEY TO THE SPECIES.—General appearance slaty-grey; forehead, eyebrow, and throat white; dorsal plumes grey; sides of chest vinaceous; breast plumes lanceolate; a full crest; tarsus not twice the length of outer toe and claw; middle claw pectinated.

HERONS, Bitterns, and Ibis represent the useful birds of the swampy country; the first named, more particularly the White-fronted species, being a good first on the list. They should be encouraged and protected to the utmost, for their

services to the farmer and grazier are invaluable. The greater the number inhabiting a district the less our land-owners have to contend against. I have observed their capacious stomachs crammed with grasshoppers, and Dr. Cobb asserts that they devour enormous quantities of *Bulinus*, the fresh-water mollusc which serves as the host of the sheep-fluke. At a certain stage the flukes leave the snail and go on to the grass.



White Ibis in Swamp.

When the grass is eaten by the sheep, numbers of the flukes are absorbed, and thus enter the liver, producing a deadly disease, from which large numbers of sheep annually die. However, before the fluke leaves its host, along comes the ever-watchful White-fronted Heron, a lover of juicy *Bulinus*, and, destroying the host, involves vast numbers of the parasite

in common destruction, thus saving the sheep and perhaps the grazier.

As a matter of fact, the White-fronted Heron is one of the most valuable friends to the agriculturists, who should see to it, as a personal matter, that so-called sportsmen who carry a gun for the simple pleasure of taking life be prevented from shooting a single member of this species. A little observation will convince anyone with common sense of the wonderful powers for good possessed by these birds, as they patrol the watercourses and irrigation channels in search of crayfish (Yabbers) and snails, or the field for grasshoppers, moths, destructive grubs, &c.

I have repeatedly watched pairs of Herons, and can testify to the thoroughness of their work from actual examination of the stomachs of those shot for this purpose. In every case I found them to have well-filled stomachs of one or more species of animals noxious to the agriculturist. The boring land crabs are kept within reasonable limits by these birds, who thus prove themselves again of infinite value to the inhabitants of irrigation areas. The great expense of sieving the channels is thereby obviated, whilst at the same time, channel banks are maintained in good order, the only price demanded by the labourers being that they be immune from persecution.

It is a pleasant sight to see the Herons at work when a horde of grasshoppers has appeared; their energy is marvellous. Too much cannot be said in favour of the White-fronted Heron, but I trust the few facts I have gathered will persuade many to withhold their hands next time one comes within gunshot, and, instead of shooting, to welcome him as a strong ally and friend, worthy of all admiration.

Other than this bird the three species severally seen in the swamps, and also most useful, are:—White-necked Heron (*Notophox pacifica*, Lath.), White Egret (*Herodias timoriensis*,

Less.), Plumed Egret (*Mesophoyx plumifera*, Gld.) Those which hide in the swamps, and are equally useful, are the Bitterns, the birds of the booming note.

Nest.—A flat structure of sticks and leaves placed upon a small horizontal fork or in a broad upright fork of a fairly large tree.

Eggs.—Four to a sitting; uniform bluish-green colour. Length, 2 inches; breadth, 1.4 inches.



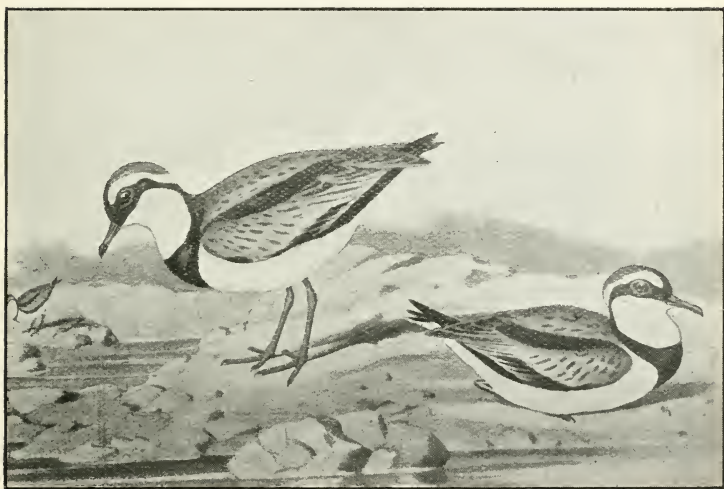
PART II.

INSECT AND VERMIN=DESTROYING BIRDS.

“THE old saying, that ‘a little knowledge is a dangerous thing,’ is exemplified in the way our Hawks and Owls are looked upon by a large majority of mankind. The farmer sees a Hawk strike a fowl which has wandered from the farm-yard; the sportsman, while planning the capture of a covey of Quail, finds the mutilated remains of a game bird, and feels sure it is the unlawful prey of a thieving Owl. Without further investigation both men condemn birds of prey as a class, and lose no opportunity to destroy them and their eggs and young.

“The ill-feeling has become so deep-rooted that it is instinctive even in those who have never seen any depredations. How are we to account for this hatred against birds of prey by the class of men who should be the first to clamour for their protection? The prejudice is largely due to lack of discrimination. Since they know that Hawks and Owls attack poultry, they do not stop to think that these depredations may be made by a few species only, but make a sweeping condemnation of the whole family. The reasoning is much the same as that of an Indian or frontiersman, who, being

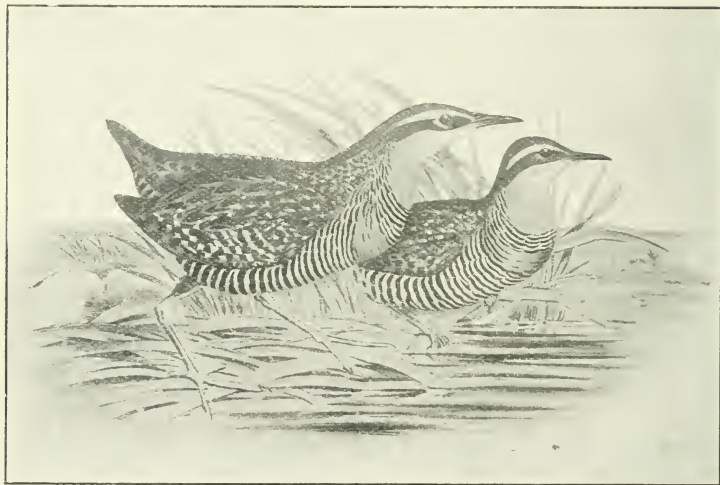
wronged by one individual, condemns a whole race. It would be just as rational to take the standard for the human race from highwaymen and pirates as to judge all Hawks by the deeds of a few. Even when the industrious Hawks are observed beating tirelessly back and forth over the harvest fields and meadows, or the Owls are seen at dusk flying silently about the nurseries and orchards, busily engaged in hunting the voracious rodents which destroy alike the grain,



Black-fronted Dottrel.

produce, young trees, and eggs of birds, the curses of the majority of farmers and sportsmen go with them, and their total extinction would be welcomed. How often are the services rendered to man misunderstood through ignorance! The birds of prey, the majority of which labour day and night to destroy the enemies of the husbandman, are persecuted unceasingly, while that gigantic fraud—the house

cat—is petted and fed, and given a secure shelter from which it may emerge in the evening to spread destruction among the feathered tribe. The difference between the two can be summed up in a few words—only three or four birds of prey hunt birds when they can procure rodents for food, while a cat seldom touches mice if she can procure birds or young poultry. A cat has been known to kill 20 young chickens in a day, which is more than most raptorial birds destroy in a



Pectoral Rail.

lifetime. That the beneficial species of Hawks and Owls will eventually be protected there is not the slightest doubt, for when the farmer is convinced that they are his friends he will demand their protection.”—“Year-Book of the U.S. Department of Agriculture—Hawks and Owls,” 1895, p. 215.

While submitting a plea for the protection of birds that give their quota of help in the subjection of animals termed

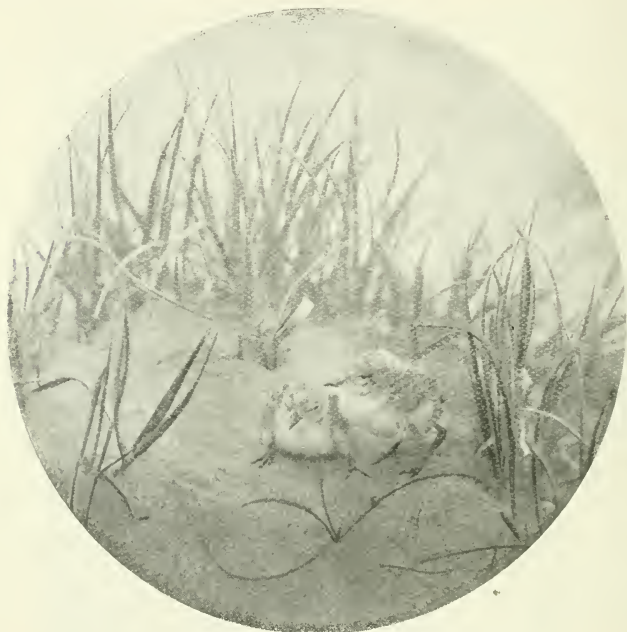
“noxious,” I do so with some little diffidence regarding certain of them. Crows and Hawks have the popular opinion against them, but I feel it is not too much to say that the



Nest and Eggs of Pectoral Rail.

majority are absolutely necessary in the maintenance of order, and in particular to the agriculturist. Upon careful inquiry concerning the Crows and Ravens that inhabit each of our

States, I find they are highly insectivorous, and make excellent scavengers. It is just a little unfortunate that they are not as virtuous as they are wise, that vice, cruelty, being rather strongly developed.



Young of Red-capped Dottrel.

The genera *Halcyon* and *Podargus*, acting partly under this head, have been specially referred to in the first part. Herons, Egrets, Spoonbills, Ibises, Plovers, Bitterns, Dottrels, and Rails, besides being destroyers of crustaceans, grasshoppers, moist-land insects, and other vermin, are harmless from the point of view of the agriculturist. These several birds may safely be considered in this section.

KESTREL

(SPARROW-HAWK),

***Cerchneis cenchroides*, Vig. and Hors.**

Serk-ně'is seng-kroi'des.

Kerchneis, the kestrel; *kenchros*, small grain; *eidos*, form.

TINNUNCULUS CENCHROIDES, Gould, "Birds of Australia," fol., vol. i.,
pl. 13.

GEOGRAPHICAL DISTRIBUTION.—Areas 1 to 9, excepting, possibly, 1
and 2.

KEY TO THE SPECIES.—General appearance rufous; head streaked with
black; tail barred with black and tipped with white. Total
length, 11.5 inches; culmen, 0.75 inch; wing, 9.25 inches; tarsus,
1.5 inches.

HAWKS and Owls may be divided for our present purpose
into four divisions, according as they are beneficial or harm-
ful:—

1. Species which are wholly beneficial.
2. Those chiefly beneficial.
3. Those in which the beneficial and harmful qualities
about balance.
4. Harmful species.

Though popularly called Sparrow-hawk, the Kestrel is not
the true Sparrow-hawk (*Accipiter cirrhocephalus*), and the
point is worth emphasizing, because the former is insectivorous
or wholly beneficial, while the latter is strictly a bird of
prey.

To science 15 species of Kestrels are known, of which one
is distributed throughout Australia, excepting, possibly, the
most northerly parts of the continent. Why the Kestrel
should be found in Derby on the west and Rockingham Bay
in the east, and no further north, is a matter that can only be
surmised. Some Falcons go into our lowest latitudes. These

two genera are anatomically closely connected, and Professor Alfred Newton suggests the possibility that both are descendants from the Sparrow-hawk of New Zealand, a bird of much higher courage than any Kestrel.

Both sexes take part in incubation, the male sitting in a hollow of another tree during the night, but relieving its mate in the task of incubation during the day. The eggs in my collection were taken from the deserted nest of the White-winged Chough. The young, which are three or four in number, when ready to fly are without yellow cere.

The flight of the bird is buoyant and easy, and when performing circles high up in the air on a summer's day they present the characteristic flight of their genus.

I have noticed the remark that insects fly high during mid-day, and the Kestrel follows in pursuit. It is nomadic, and is guided in its wanderings according to the movements of the various insects and other food upon which it subsists. The specific name applies to a certain disposition of the markings.* A new species was discovered last year by Mr. Milligan in Western Australia.

Nest.—The *débris* in a hollow spout, or on a cliff side.

Eggs.—Four to a clutch; colour reddish-brown, the blotches and spots being heavier than the ground colour, and varying in intensity. Length, 1.5 inches; breadth, 1.2 inches.

* *Cenchrus* is a species beyond Australia. It is not improbable *Cenchrus* was so named because of its likeness to the form of that species.

BROWN HAWK,

***Hieracidea orientalis*, Schlegel.**

Hi-e-ra-sid'e-ä ô-ri-en-ta'lis.

Hierax, a hawk; *idea*, resemblance; *orient*, east; *alis*, pertaining to.

IERACIDEA BERIGORA, Gould, "Birds of Australia," fol., vol. i., pl. 11.

GEOGRAPHICAL DISTRIBUTION.—All through Australia and Tasmania.

KEY TO THE SPECIES.—General appearance brown; under surface of body creamy-buff to blackish-brown; cere blue-grey; tarsus transversely plated near base of toes.

THIS species may be safely placed under section two—those chiefly beneficial. (See page 200.)

The Eastern Brown Hawk is found in all the States, and a second and closely allied species is found in the western portions of Victoria and New South Wales. From these areas the two species go across the continent, the association of the two at the meeting points—*e.g.*, the Mallee district of Victoria—leading to a good deal of confusion in identification.

The Striped Brown Hawk is striped on the under surface. With the advance of age this part becomes creamy-white; then, and not till then, a distinct difference is noticeable in the two species. The young of each very closely resemble one another and both vary considerably, so that the difficulty of distinguishing between the species, even in one-year-old birds, is one not easily surmounted.

Though Brown Hawks occasionally prey on small birds—domesticated and feral—the greater portion of their diet is composed of insects, snakes, lizards, and carrion. An examination of their stomachs during the time when insect pests are most rampant shows that the birds are, without doubt, beneficial to man, for caterpillars and grasshoppers may be found therein in great abundance.

As in the case of the Owls, the female Hawks are much larger than the males.

The birds usually associate in pairs, excepting when a horde of caterpillars is travelling across the land; then, according to Mr. Gould, several hundreds will come together and create great havoc along the line of march, thus unconsciously benefiting human kind.

Nest.—Open, cup-shaped, and large, made of sticks and lined with fibres or light twigs. The position of the nest may be high on a swaying branch, or near the ground in a stunted tree.

Eggs.—Two or three for a sitting; the ground colour may be very pale chestnut, with blotches of strong reddish-brown upon it, or the blotches may be light and one end of the egg have a whitish ground. Length, 2 inches; breadth, 1.5 inches.

BLACK-SHOULDERED KITE,

Elanus axillaris, Lath.

E'la-nus axs-il-a'ris.

Elanus (?); *axilla*, arm-pit.

ELANUS AXILLARIS, Gould, "Birds of Australia," fol., vol. i., pl. 23.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—General appearance greyish-white; shoulder black; axillaries white; bare part of tarsus in front less than middle toe.

THERE are several species of Kites in Australia, but the only one that need engage our attention at the present is the Black-shouldered, which is found practically all over Australia. Some little care is necessary to distinguish it, because a close

ally (*E. scriptus*, Gld.) exists, which differs only in having the axillaries black and a black bar beneath the wing. From this marking it receives its name, the Letter-winged Kite.

The Black-shouldered Kite, unlike the birds of prey, possesses feeble bill and legs, hence it is a semi-insectivorous bird. The distribution of this species is in the warmer parts, only occasionally passing south of the Dividing Range. It is a truly arboreal bird, loving to perch on the dead limbs of high trees or among the topmost branches, and is seldom seen on or near the ground.

Nest.—Open, and composed of twigs, and internally lined with fibres and small twigs.

Eggs.—Three or four in number; ground colour where visible, white, mostly smeared with blotches of a reddish rusty-chocolate. Length, 1.6 inches; breadth, 1.25 inches (A. J. North).

BOOBOOK OWL,

Ninox boo-book, Lath.

Ni'noks boo-book.

Ninox [*ni*, not (neither, *i.e.*, twilight); *nox*, night?]; *boo-book*, in imitation of its call.

ATHENE BOOBOOK, Gould, "Birds of Australia," fol., vol. i., pl. 32.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—General colour rufous; interscapulum not spotted; wing 10.25 inches long; tarsus not twice the length of middle toe; facial disc unequal, the part above much larger than that below; outer toe reversible.

"HAWKS and Owls are complementary to each other. While Hawks hunt by day, and keep diurnal mammals in check,

Owls, whose eyesight is keenest during twilight and the early hours before dawn, capture nocturnal species, which the former is not apt to obtain. Again, the Owls are less migratory than the Hawks, and during the long winter nights they remain in



Boobook Owl.

the land to wage incessant warfare against the little enemies of the orchard, garden, and harvest fields.”—“Year-Book of the U.S. Department of Agriculture—Hawks and Owls,” 1895, p. 216.

Of all the Australian Owls this is the best known, and possibly the most useful. In nature it plays a wonderful part; silent and unobtrusive, yet performing its avocation surely and perseveringly. When we consider that there are some 765 species of birds in Australia, and only, say, two dozen able to do the night work of checking the ravages of noxious insects, we should see that a careful preservation of all be strictly enforced. The late Mr. Gould remarked—"In no other country is there a greater proportion of insectivorous birds than in ours, and certainly none in which nocturnal species such as the Podargi (Frogmouths) are more numerous." Numerous though they be, they are all needful, and it is incumbent on all who have the welfare of the farming community at heart to protect these night workers from destruction.

Owls frequenting the neighbourhood of haystacks and barns are a safeguard against night-flying insects and the depositing of their ova. The Powerful Owl (*N. strenua*) is possibly the only species that regularly kills small birds. The others have a varied diet—small insects and small quadrupeds. *Ninox boobook* eats insects of various orders, principally locusts and other neuroptera; only occasionally is a small bird captured.

The Owls of this Continent are divisible into two families, two noticeable features serving to separate the two. In the first division the "wishing bone" or furcula is not attached to the breast bone (sternum), and the middle toe is not serrated as in the Bubonidæ; and, in the second, the furcula is attached to the sternum, and the middle toe (claw) is found to be serrated. The two families include 13 species and 2 sub-species. Our largest Owl measures 2 feet in length, the smallest 13 inches. Certain of them keep to heavily timbered country, others to the sparsely wooded lands. All breed in hollows, and lay white eggs.

The call of this species is the well-known "boo-book" or "more-pork," wrongly ascribed to the Frogmouth.

Nest.—Hollow of a tree, with decayed wood for the eggs to rest upon.

Eggs.—Three to a sitting; white and finely pitted. Length, 1.5 inches; breadth, 1.3 inches.

CROW,

***Corvus coronoides*. Vig. and Hors.**

Kôr'vus kor-o-noi'des.

Corvus, a raven; *korone*, a raven; *eidōs*, form.

CORVUS AUSTRALIS, Gould, "Birds of Australia," fol., vol. iv., pl. 18.

GEOGRAPHICAL DISTRIBUTION.—Areas 1 to 8 inclusive.

KEY TO THE SPECIES.—Plumage uniform blue-black; neck and body feathers snow-white at the bases; first primary is long, equal to or exceeding the innermost secondaries; hallux very strong.

It is generally admitted that Crows and Ravens possess the highest standard of reasoning power among birds, and I think none who have any acquaintance with their ways will be inclined to disagree with this dictum.

We have two Crows and a Raven in Australia. The first-named is very much in evidence, with results so good that many people who have carefully watched their habits say they are of definite value to us. The side for the prosecution, however, is very scathing in its criticisms of the Crow's value. Dr. N. A. Cobb (*Agricultural Gazette of New South Wales*, 1896, pp. 565–578), by a careful comparison, concludes that the food of the Australian Crow is on a par with that of the American one. To test the value of the common Crow in the States, the Government at Washington arranged to

have 1,000 Crow stomachs examined. The investigation of the whole matter was thoroughly made, occupying nearly ten years, and engaging the attention of specialists for portions of that time. "I gather," says Dr. Hart Merriam, speaking from the results of these investigations, "that Crows have a predilection for insects possessing a strong odour. For this reason they destroy a large amount of insect life that many



Nest and Eggs of Crow.

other birds pass over. The percentage of fruit eaten during the year is trivial, and the amount of birds' eggs and young poultry shows 1 per cent. of the food supply for the year. Insects form 26 per cent. of the entire food, and the bulk of these are grasshoppers, cut-worms, and other injurious kinds. When insects are abundant they form the bulk of the food."

In summing up the evidence gathered during the ten years, Dr. Hart Merriam says :—"It is clear that the good exceeds the bad, and that the Crow is a friend, rather than an enemy, of the farmer."

Dr. Cobb makes some suggestions as to keeping it in order. "The shooting or poisoning of the bolder Crows that pull sprouting grain or steal fruit is so obviously commendable that the law should not interfere with the farmer's efforts in this direction. On the other hand, so useful a bird should not be outlawed. The best way to deal with our sable friend is to frighten him away from the place he is likely to damage, but otherwise to let him alone." Certain means are recommended, such as scarecrows, windmills, pendent tins, poles and strings, poison, tarred grain, etc.

"Just consider for one moment the helplessness of man before an advance of a plague of grasshoppers. Day by day the young hoppers issue from their breeding grounds, and in countless numbers make their way over the country, on foot or by flight, eating every green thing. To-day the country is flourishing; to-morrow the plague passes by, leaving desolation, and often ruin, in its path. One who has not experienced it cannot imagine the feeling of utter gloom wrought by such a visitation. Nothing will avail against it. All the scientific experts in the country may fire insecticides by the ton into such a mass without any appreciable effect. It would be like Mrs. Partington trying to keep back the Atlantic Ocean with a mop. The fields of nature are, however, patrolled by a feathered police, whose function it is to keep this destructive insect in check, and if man does not interfere with these friendly watchmen locust plagues will be much fewer, and less destructive when they do occur, while the ravages of ordinary seasons will be kept at a minimum."

Nest.—Placed high or low in a tree, composed of sticks and twigs, and lined slightly with softer material. The open nest

is a bulky one. Figured above is a nest in polygonum growing in a swamp, photographed from a buggy.

Eggs.—Four or five to a clutch; greenish appearance, with blackish-brown or brown spots and blotches. Length, 1.5 inches; breadth, 1 inch.

RAVEN,

Corone australis, Gld.

Ko-rō'nē âs-tra'lis.

Korone, a raven; *australis*, southern.

CORONE AUSTRALIS, mounted specimens States' Museums.

GEOGRAPHICAL DISTRIBUTION.—The whole of Australia and Tasmania.

KEY TO THE SPECIES.—Plumage uniform blue-black, base of feathers dusky brown or black, not snow-white; first primary longer than ordinary secondaries, but shorter than the innermost secondaries; hallux very strong.

MR. Price Fletcher, in his Queensland travels, writes:—"The Raven is undoubtedly the most commonly seen bird in nearly all Australia, excepting in the towns and suburbs. No home-stead exists in the country which is not visited by Crows; indeed, hardly a traveller can camp for the night but his tent and fire are discovered by this keen-sighted bird. In fact, he may well be said to be the bird most knowing and most gifted with reasoning powers we have in the colonies, and we have some of great intellectual ability."

It is not so prominent a bird in south-west Australia, and appears there to be represented by the Crow. In size, "the largest Raven is the greatest of the Passerine order." According to leading anatomists, it is probably the most highly developed of birds.

Mr. L. D. Cameron's letter to me, dated 10th April, 1898,

contains a valuable contribution to our knowledge of the sagacity displayed by the Raven, and incidentally shows that they are non-sensitive about the gastric region ; they seem to be able to swallow a thing and throw it up again at pleasure. "The Messrs. Cheriton, who reside at Mossiel, New South Wales, have a pet Raven and a Magpie. The Raven would eat till it had enough, and then swallow more, retire, and with a fixed purpose disgorge it in some hiding place. If, while it was hiding the food the Magpie was seen to be watching, it would immediately re-swallow it, and go to some other place. It was noticed to do this when the Magpie was in close attendance, and as the bird could find nowhere else to go, it retired under the dress of a lady and deposited the food there. On another day a flock of Ravens were being invited to sup from a poisoned carcass. Having a secret watch put upon them, one or two swallowed pieces, and were noticed to quickly disgorge the strychnined morsels as if they knew something was amiss. Whether from taste, intuition, or previous experience they did this I cannot say."

If the Raven is an eater of dead matter, it is also predaceous to a most useful extent, for it devours large numbers of the *Cicadæ* (so-called locusts), thereby lessening the now well-known ravages of these insects at the roots of fruit trees. Both Crow and Raven (as we term our so-called Crows) give chase to the "seventeen-year-old insects." Having captured one while on the wing, the bird settles upon a tree, holds it in one set of claws, sucks the juices from the trunk of the animal, and then drops it to the ground, still alive. This warfare against the *Cicada* goes on at different parts of the State during the spring season, and perhaps later. After a bush fire they feed very largely on insects, half-roasted quail, &c.

In writing of the nesting of the Crow, Mr. Cameron sends me the following note from the interior of New South Wales :

—"I found a nest of a Raven in September, 1896, containing four young birds. It was on the ground, and at least two hundred yards from any timber. The nest was built just as usual, but was flat on the ground. I have heard of other nests in our district on or very close to the ground, but have only seen one myself. The country referred to is most miserably timbered, and I do not believe two pairs of Crows would agree to have their houses up the same stunted tree."

With regard to further anomalies, I have seen clutches of eggs uniformly blue, and at other times to consist of one hard-sat egg. One specimen of a bird had a white head (South Australia). The sail area of the Raven in relation to its total weight is as large as that of any bird (observation of Mullenhoff). Because of the highly developed pharynx it is placed by Dr. Sharpe among the singing birds. I venture to think a little voice-education would do much good in this case, and probably efface the heavy blot of prejudice against it.

Nest.—A bulky structure like that of the previous species.

Eggs.—Similar to those of the Crow, or perhaps a shade larger ; many are smaller.

BUTCHER-BIRD

(TASMANIAN JACK, WHISTLING JACK, COLLARED CROW-SHRIKE),

***Cracticus destructor*, Temm.**

Krak'ti-kus dēs-truk'tor.

Kraktikos, noisy; *destructor*, destroyer.

CRATICUS DESTRUCTOR, Gould. "Birds of Australia." fol., vol. ii., pl. 52.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—Throat white; back grey; flanks and sides of upper breast greyish-white; bill strong and well hooked; culmen, 1.25 to 1.5 inches in length; nostrils longitudinal slits about the middle of the bill.

THIS is the bird I love to think of as the autumn songster. As a whole, the bird fauna is at its brightest strength of song in the spring and nesting time. The Reed-Warbler tunes his warbled lay in the swamps in the dark hours of the night; the Black and White Fantail in the timber when the diurnal forms of life are sleeping; and the Bush-Lark at heaven's gate when the moon is pouring its light upon the cornfield. Then the autumn comes to claim the hedgerows and Butcher-birds to play their part. To myself this is a part of autumn: a charming quarter of the year.

Altogether nine Butcher-birds are found in Australia. The present species is the most common of the genus. *C. nigricularis* occurs in the dry parts of the Murray River system. The Magpie is the nearest relation to the Butcher-bird, but one is much more insectivorous than the other. When named *Lanius* in the first meeting, it was well called so, as it is a true butcher in so far as it hangs up little birds (Silver-eyes, &c.) within forked branches and proceeds at once to dis-

member them, one at a time, to satisfy its appetite. At a later date the generic name was changed to *Cracticus* (noisy). This not only indicated one means of recognizing the bird, but in addition removed the delicate subject of bird-destroyer



Collared Crow-Shrike.

from it. That was well, because vermin and beetles form a very large portion of its food. In autumn the bird is garrulous, and has a musical and rich liquid note. That Butcher-birds are pugnacious is quite evident to me. I know

of three that tried to fight their shadows in water and finally got drowned. I am sorry to write so, but this bird is rather fond of stealing canaries when it is making its autumn tour of the outskirts of suburbs. In a few words, it pounces upon the cage, disconcerts the domesticated bird, and subsequently gets it out piecemeal, if not whole. I have the knowledge of at least a score of cases, though I say so without prejudice, because of its other good qualities.

Nest.—Cup-shaped, made of twigs and lined with grasses or rootlets. It is placed in any trees of the district, without a preference being shown.

Eggs.—Three or four to a sitting; the ground colour may be olive-green or tawny brown, spotted with dull chestnut and nondescript black. Length, 1.25 inches; breadth, 1 inch.

GREAT BROWN KINGFISHER

(LAUGHING JACKASS),

Dacelo gigas, Bodd.

Da-se'lo gi'gas.

Dacelo, a transposition of *alcedo*, a Kingfisher; *gigas*, giant.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 7; occasionally 2.

KEY TO THE SPECIES.—Crown rufous-brown in centre, white on sides; a band of brown on nape; culmen ascending towards tip of upper mandible. Total length, about 18 inches.

OF all the Kingfishers in southern Australia this is the one doing most damage in the destruction of useful lizards. At the same time it keeps in subjection an amount of insect life, while it feeds on rats, mice, and centipedes in addition. It steals

and eats many young birds of different species that would have grown up to be placed in Part I.

Australia, a zoological sub-region of the Australian region, has five types of Kingfishers, which, for our present purpose,



Leach Kingfisher.

may be divided into “water” and “land” fishers. The water birds are again divided into (a) short-tails, (b) long-tails; and the land birds into (a) saw-like bills, (b) giant bills, (c) normal bills. It is under (b) of the second section our

friend the Jackass takes its place. The three members of this genus are disposed in two cases strongly on the eastern side of the continent, and in the third scantily on the northern. It is very rarely a specimen of any is seen in the great south-west—which species is still in doubt.

The Great Brown Kingfisher is the most common species in the south. Leach's Kingfisher has its stronghold in the tropical east.

The Great Brown Kingfisher is the "Bushman's Clock"—early to rise and early to bed, with a deal of strange and merry laughing to announce each occasion. In fact, its voice is an extraordinary one. Most of us enjoy to hear a family. The quickly rising tones of a medley of voices coming down a chimney in the early morning is a divergence from the "ringing-up" time. To a drowsy sleeper the great hall of the chimney would certainly seem to be in pandemonium. It resorts to all kinds of country—the heavy timber, the clumps of timber in dry areas, and in the close environment of all tilled lands. Its food ranges from insects destructive on the farm to rats and snakes. Unfortunately for our sentiment with the bird, it destroys large quantities of useful lizards. To test its hunger I supplied it one day with sixteen lizards (*Hinulia*, sp.), and on the following day with seven blood-suckers (*Amphibolurus*), large specimens. It pulps them if too large to swallow. It gives an hour or more to the pounding process, and a day or less to the digestion of it. It can swallow a rat, whole, when so pounded. I have seen it very slowly swallow a copper-headed snake.

Nest.—Simply a convenient hollow in any eucalyptus tree, with decayed wood to place the eggs upon.

Eggs.—Two or three to a sitting; pearly white. Length, 1.8 inches; breadth, 1.4 inches.

PART III.

INSECT AND SEED-EATING BIRDS.

THERE are a number of birds that confine themselves neither to vegetable nor animal food. They serve the interests of the agriculturist and fruit-grower by eating numerous kinds of lowly-organized animals and seeds of uncultivated plants, or seed not further needed. The Quail is an example. It checks the insects harboured in the fields, in addition to consuming a large proportion of seeds not needed for growing purposes. Birds as the Pipit, Song-Lark, Grass-Warbler, and Whiteface, though seed-eating as well as insectivorous, play so important a part in the economy of agriculture that they have been placed in the leading head. It may be thought the Magpies should rank under this category, but they appear to me to be so genuinely insectivorous that I have placed them in the first part. The Mallee Fowl, because of its unique position in the bird fauna, and its approaching time of extinction in the east, is worthy of special notice. A further record of its habits, very different from those of other birds beyond mound-builders, should make interesting and instructive reading.

MALLEE FOWL

(LOWAN, MALLEE PHEASANT),

***Lipoa ocellata*, Gld.**

Li-po-a os-el-ä'tü.

Lipein, to leave ; *oon*, egg ; *ocellata*, little eyes.

LEIPOA OCELLATA, Gould, "Birds of Australia," fol., vol. v., pl. 78.

GEOGRAPHICAL DISTRIBUTION.—Areas 6, 7, 9.

KEY TO THE SPECIES.—General appearance black and grey, under surface partly scaled ; top of head covered with feathers, forming a short, thick crest ; nostrils elongated and oval ; tail long, rounded, with 16 feathers ; the long upper tail coverts reach to the end of the tail ; a double row of large hexagonal plates down the front of the rather short tarsus.

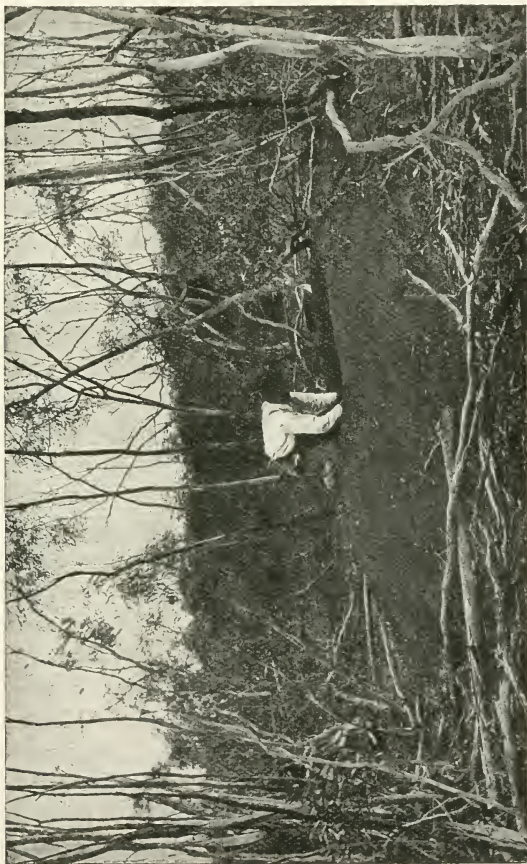
WE have in Australia four species of mound-building birds, one of which is associated with the dry portion of the Commonwealth. Although to a large extent insectivorous, they are not strictly so.

Judged by the country this species occupies, and its manner of living, it is one of the unique birds of the world, and belongs to a genus that has helped to make Australia zoologically famous. Like certain of the Reptilia, it arranges for artificial heat to incubate the eggs in a mound of sand and decomposing leaves. Such a hillock I measured, and found it to have a circumference of 48 feet.

A good general history of the bird has been given in *The Ibis*, 1899, by Mr. W. H. D. Le Souëf, C.M.Z.S. The author well remarks :—

"The bird has an extensive range in the southern half of Australia, being found in the north-western portion of Victoria, south-western portion of New South Wales, southern South Australia, and Western Australia. It is,

practically speaking, found wherever the mallee (a dwarf eucalyptus) grows, and hence the name of the bird, as it is always associated with the mallee or similar scrub. The



Nesting Mound of Mallee Fowl.

country where this tree grows is mostly sandy, and has a small rainfall, often being intersected with sandy ridges,

popularly called pine-ridges, from the fact that the Murray pine generally grows on them.

“The male and female birds differ very little in markings, and their mottled black and grey colour harmonizes wonderfully with their surroundings. As they are shy and solitary, they are rarely seen, but specimens are sometimes obtained by patient watching near their nesting ground. They occasionally utter a low, soft note, and their gait, when undisturbed, is a slow walk, although they can run fast if necessary. Their food consists of insects, berries, and the buds of a small shrub. They go to roost in trees when it is almost dark.

“The nesting-mound of these birds is generally situated close to some pine trees, or with thick scrub near or round it, and rarely without cover being near. When the scrub has been cut down round their old nesting-place they leave it and form another, but they prefer to make up their old mounds if possible, and the same places are often used year after year. When the birds have selected a site, they scrape out a slight hollow in the ground, from 6 to 8 inches deep in the centre, and about 2 feet wide. Next they scrape up leaves, bits of bark, twigs, and other vegetation that may be lying about, and put enough on, not only to fill the depression, but to make a small mound of it, about 8 inches or more above the level of the surrounding ground. They then form a hollow in the centre of the vegetation about 1 foot wide and 6 inches or more deep, this being the egg-chamber; after which they scrape sand all round the nest and leave it until rain comes and well wets the vegetation. The sand is then spread well over the mound to a depth of about 6 inches; and after a few days, when the vegetation has heated, the mound is ready for eggs. The nest is generally made in July or August, and the first eggs are laid towards the end of September, but the absence of the necessary rain sometimes makes it later. Both birds assist in

making the mound. The sand is scraped together with both the feet and the wings, the latter being used especially when getting the sand well up on the mound, which, when finished, often measures at the base 12 feet in diameter, and in the centre from 2 to 4 feet high, and as the sand is generally dry, and runs freely, it is no easy matter for the birds to heap it up as they do. The various measurements given are about the average, as they differ more or less in every mound. The nest being ready for eggs, the hen bird scrapes out most of the sand from the egg-cavity, and leaving about 2 inches of it at the bottom, she then lays her egg, and holding it upright with one foot, with the small end downwards, she scrapes the sand round it with the other foot until it can stand alone. The bird has to lean well back to enable her to use both her feet. She then covers the whole with sand. The egg-cavity has to be scraped out and refilled every time an egg is laid, giving much work to the parent birds. The eggs are generally placed at the outer edge of the chamber, and one often in the centre. The first eggs are covered up with about 2 inches of sand over them, and a second tier commenced, each egg being laid opposite the interspaces of the lower lot. There are generally three tiers, with from three to five eggs in each, and a full clutch is about 14. I have always found the temperature of the egg-cavity to be from 95° to 96° Fahr. The eggs are laid at daybreak on every third day, and incubation takes a little over five weeks. As incubation starts as soon as the egg is laid, the young ones are ready to hatch at different times. The eggs are usually of a delicate pink colour, especially when first laid, but the pink colouring matter easily comes off, especially after the egg has been taken out of the nest for some little time, and leaves the white under surface exposed ; occasionally I have found all the eggs in one mound pure white. The shell is very fragile, and one reason why the eggs are placed on end is evidently to sustain the

weight of sand with which they are covered; the ground round the eggs is generally slightly damp. Sometimes when the parent bird is opening up the mound she scratches a hole in the top of one of the eggs; the sand then gets in, and, mixing with the contents, forms, when dry, a compact sandy mass, completely filling the shell. On one occasion I found five such eggs in one mound.

“There has been much discussion as to whether the young birds can make their own way out of the soil unaided by their parents. In order to settle it I covered in with wire netting a nest with several eggs in it, so that the parents could not open it up, and found all the chickens, when they came to maturity, dead in their shells. Then, again, on taking the eggs from a nest you often find chickens in their eggs which are ready to hatch, especially in the lower tier, so much so that when opening the egg you have to hold the young bird firmly to prevent it escaping and running away. Then, on other occasions, you find chickens near the surface under the sand, apparently working their way out unaided. The old birds open up the nest to a certain extent at daybreak, and it is probable that any chickens that may be ready to come out, especially in the lower tiers, do so then. Moving the sand also prevents it from becoming set. But the chickens that hatch from the eggs of the top tier, the sand there not being set so tightly, and being drier and running more freely, are able to force their own way out, and, judging from the experiments I have made, I should say this was usually the case. On opening up the nest that had been wired in, I found that the sand had set rather tight, especially where the eggs were, and this I should say fully accounted for the young birds being unable to come out.

“When the mound is opened up during the day and eggs abstracted, the parent birds repair the mound shortly after the intruder has gone away, showing that either one

or other of the birds generally remains in the neighbourhood.

“When the young are hatched they are well able to take care of themselves, being strong and well developed, and their wing feathers sufficiently formed to enable them to fly a short distance; but they trust almost entirely to their running and hiding to escape danger, and to catch a newly-hatched young one in the scrub is no easy matter. The parent birds seem to take very little notice of their young, which lead an independent existence from their birth.”

Because of the peculiar habit the adults have of leaving the nest, the generic name *Lipoa* has been applied. The “little eyes” most likely refers to the plumage marks, though they are not very definite.

The judgment of my companion, Mr. Arthur B. Lord, in making an exact photographic exposure while I arranged other matters has produced an excellent picture of the nest.

Nest.—A large mass of sand and leaves, with a diameter of 13 feet and a height of 3 feet, approximately.

Eggs.—Six to fifteen in a mound; colour delicate pink to brick red. Length, 3.5 inches; breadth, 2.25 inches.

STUBBLE QUAIL,

***Coturnix pectoralis*, Gld.**

Co-tur'niks pek-tō-rā'lis.

Coturnix, a quail ; *pectus*, the breast ; *alis*, pertaining to.

COTURNIX PECTORALIS, Gould, "Birds of Australia," fol., vol. v., pl. 88.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7.

KEY TO THE SPECIES.—Outer web of primaries uniform brown, not barred and marked with buff.

Male—Throat dull brick colour.

Female—Black bands on the feathers of the breast not confluent in the median line, but separated by a buff isthmus.

AMERICANS believe the Quails to be of far greater value when alive and roaming freely about the farm. The food of the North American common Quail has been carefully studied by Dr. S. W. Judd, of the U.S. Biological Survey, with results that will doubtless surprise many people. Speaking of 13 birds which he shot, he says :—"These 13 had taken weed seeds to the extent of 63 per cent. of their food. Though the stomachs and crops were not well filled, the birds had eaten 5,582 weed seeds, and one bird, in addition to other weeds, had consumed 550 seeds of that farmers' curse, the sheep sorrel. Another bird had swallowed 10,000 seeds of that abundant and noxious pest, the pig-weed. Amongst the insects eaten were found large quantities of potato beetles, cut-worms, and chinch bugs. One specimen ate 47 cotton-boll weevils in a morning meal." Crops and stomachs are frequently examined with nothing but ragweed. On a very conservative basis the total consumption of weed seeds by the Bobwhite Quail between 1st September and 30th April, in Virginia, amounts to 573 tons.

The losses caused by many pests show how desirable it is to protect a bird that habitually destroys them. In Australia

our observations lean us to similar conclusions. Economically it will pay much better to have the birds alive and at work upon the farm.

The Australian Quails are divided into two orders—one with each member having a hind toe, the other with each member not having a hind toe (an exception, *i.e.*, Plain Wanderer). In the first order we have the Stubble, Brown, and King Quails; in the second, seven Hemipodes and the



Stubble Quail.

Wanderer named. In a comparison with the Quails of the world, it appears we have only one true Quail. However, for our economic purposes the Button Quails (*Hemipodii*) are sufficiently good.

The Stubble or Pectoral Quail, averaging $4\frac{1}{2}$ ozs., is the largest of our so-called Quails, while the King or Chestnut-bellied Quail is the smallest. So small is the latter that the

total weight of a female weighed was found to be less than $1\frac{1}{4}$ ozs.

The Stubble and Brown species very often occupy the same paddocks in open grassed country, while the King species keeps more to scrub lands.

With the ending of the "close season" for shooting game, most sportsman go abroad to shoot for a day or more. One of my acquaintances, with two of his friends, accompanied by their best dogs, recently shot 728 birds in three days; while about 1890, on the South Australian-Victorian border, another much stronger party, with eight guns, shot 900 birds. The ruin of young birds upon the field after such a time is appalling, and I consider it is iniquitous to have such a state of affairs as may be observed by anyone accompanying a party of this nature. Some shooters are honourable, and allow poor fliers (young) to pass; others are thoughtless. By the shooting of Quail at too early a date thousands of young chicks are left as orphans to die. This I judge partly by the female bird showing a bare breast, that testifies to the late sitting upon her eggs. From a humane point of view sportsmen might well stay their hands a little longer time. For farmers to allow the birds on their land to be shot too early is courting trouble, because they are slowly killing the insectivorous "goose that lays the golden egg."

I have introduced the question here because it is fit and proper, as I see it.

The Stubble and Swamp Quails each lay a large number of eggs (8 to 10), and it is surprising how they will cover and so uniformly incubate them. Mr. G. A. Keartland describes the process of rearing a brood in the following way:—"The long feathers on the sides of the breast spread out at right angles from the body till the bird could hide an ordinary tea saucer. Although the male bird passed most of the time beside his mate, I do not think he took any part in the work of incuba-

tion, as he never stayed at the nest when the female was away. Early on the 3rd of February I saw broken egg-shells near the nest, and two small chocolate-coloured heads protruding from under the wings of the female, but the male was perched on the Parrots' log, about four feet high. Next morning five chicks were seen following the mother. The male bird kept out of the way, preferring the company of the Parrots to that of his wife and family. Unfortunately some of the chicks got into the water dish, and one was drowned; but the other four are thriving well, and have wing feathers over an inch long. The male bird is now in constant attendance on them, and when finely-chopped meat or green vegetables are thrown to them he picks up pieces and holds them in his bill until the young ones take them from him. They all scratch like common fowls, and are fed principally on canary seed." Green grass is a valuable help in their diet.

Nest.—A loosely made bowl of grass placed in a slight depression in corn or grass.

Eggs.—Seven to twelve; ground colour tawny, heavily marked with coarse blotches and spots of dense brown. Shape, swollen oval. The markings vary considerably in density and distribution. Length, 1.15 inches; breadth, 0.9 inches.

PAINTED QUAIL,

Turnix varia, Lath.

Tur'niks vā'ri-a.

Turnix, said to be clipped from *coturnix*, a quail ; *varia*, spotted.

HEMIPODIUS VARIUS, Gould, "Birds of Australia," fol., vol. v., pl. 82.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 9.

KEY TO THE SPECIES.—*Adult male* has chest buff, irregularly spotted and marked with grey ; no rufous nuchal collar, but otherwise the upper surface similar to that of adult female.

Adult female has chest grey, each feather with a pale buff or whitish shaft streak, becoming more or less spatulate towards the margin ; feathers surrounding eye black, spotted with white ; has a fairly defined bright rufous nuchal colour, each feather narrowly barred with rufous. Bill stouter than in male.

ALL the Turnices are Hemipodes, *i.e.*, half-footed, having no hind toe, but all the Hemipodii are not Turnices, owing to the one exception—the Plain Wanderer—having its foot whole-toed.

The Painted Quail is a member of the group termed Button Quails, the many species of which are found in large numbers on the eastern side of our continent. The western portion, on the other hand, has one species only—viz., the Painted Quail.

A noticeable feature of the many differences existing between Button Quails and true Quails lies in the fact that the former will lay four eggs as a rule for a sitting, and the latter seven to ten. In habits, however, they are similar.

The Painted Quail frequents stony country, slightly wooded and grassed, or heavily timbered lands at discretion.

The Plain Wanderer has a buff collar on the neck, a hind toe, and lays three to four eggs, so that it is neither a *Turnix* nor a true Quail. The breeding season commences early in



Eggs of Chestnut-backed Quail.

September, and ends in February; but it may vary considerably. One clutch was found on 7th June, 1900.

Nest.—Similar to the preceding one. It is usually placed beneath a tuft of grass.



Painted Quail on Nest.

Eggs.—Four to a sitting; shape, swollen oval; pale buff ground with minute spots of reddish-brown and brownish-grey all over it. Length, 1 inch; breadth, 0.75 inch

BUSH-LARK

(THICK-BILLED LARK),

Mirafra horsfieldi. Gld.

Mir-af'rä hôrs-field'i.

Mirus, wonderful; *africus*, Africa; *Horsfield*, a proper name.

MIRAFRA HORSFIELDII, Gould, "Birds of Australia," fol., vol. iii., pl. 77.

GEOGRAPHICAL DISTRIBUTION.—Areas 1, 2, 3, 4, 6, 7, 8, 9.

KEY TO THE SPECIES.—Blackish centres to the grey feathers of head and back; bill very strong and short; nostrils exposed, with a superior membrane; planta tarsi (sides and back of tarsus) scutellated.

VERY few people realize that about half the birds they call common Ground-Larks are in reality Bush-Larks. Both are true meadow birds and equally wide in distribution over the continent, and being occasionally found associating in the same paddocks, it is little marvel that the species are confused one with the other. The Bush-Lark, however, has a strong, finch-like bill, and a shorter body than the Pipit.

Africa is the stronghold of the genus, hence, probably, its name, *Mirafra* (from *Africus*, Lat. for Africa).

Many authorities maintain that this species is the only member of the family Alaudidæ (*Alauda*, a great songstress), or true Larks, but with all due deference to this opinion I am inclined to think that our Song-Larks come very close in beauty of song. It is in great measure a matter of opinion. I have heard from this Lark most delightful music in the early and late dark hours. Even in the "noon of night" it floats high in the moonlit air, and gently breaks the quiet with its rich, sweet voice, rather weaker than the strong voice of the British Singing Lark.

Nest.—In general aspect much like that of the Pipit, and placed in a slight depression in a paddock.

Eggs.—Three eggs to a sitting; ground colour light brown, thickly sprinkled with fine spots of a darker brown. Length, 0.75 inch; breadth, 0.5 inch.

STRIPED GROUND-TIT

(LITTLE FIELD-WREN, STREAKED WARBLER),

***Chthonicola sagittata*, Lath.**

Tho-nik'o-lä saj-e-ta'ta.

Chthon, earth; *colo*, to inhabit; *sagitta*, an arrow.

CHTHONICOLA MINIMA, Gould, "Birds of Australia," fol., vol. iii., pl. 72.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6.

KEY TO THE SPECIES.—Plumage olive-brown; throat and under surface very pale yellowish, with broad black arrow-like streaks, broader on breast and sides; under tail coverts uniform yellow; tail quite even, tarsus scutellated; first primary long, half length of whole wing.

My experience of the one species of this singular genus, also peculiar to Australia, has been in well-timbered land just west of the Dandenong Ranges in Victoria.

Its voice leads nomenclators to class the Striped Ground-Tit with the Warblers. While at one time its voice is made up of two or three pleasant and gentle high-pitched notes, at others it is quite contradictory, being a single harsh and grating note, or a series of such notes when alarmed.

In habits the Ground-Tits appear to be a combination of Tits and Pipits. Like the Pipit, it builds a nest on the ground, placing it in a somewhat similar position, but the structure recalls in appearance that of the Tit.

It feeds on insects as the Tit does, but varies this diet with one of seeds, in this respect resembling the Pipit. It might be thus appropriately called a Lark-Tit from one point of view.



Striped Ground-Tit.

When we come to consider the internal structure of the Ground-Tit, we again find many points of common resemblance to the Tits and Pipits, and even the Wrens, so that, in order to obviate further confusion, it has been

named *Chthonica sagittata*. By this name it is known universally.

The Striped Ground-Tit is a ground-loving bird, and is easily recognized by the markings on its under surface, which resemble tiny black arrows shooting through its plumage. How very carefully the nest is concealed is only known to those who have sought for it, and one might hunt for days without success unless the system necessary to the finding of ground birds' nests is adopted. Patience is the virtue ever to be commended. Under a small cluster of leaves of any native shrub, and with the upper portion closely mimicking its surroundings, a dome-shaped, side-entranced nest is placed upon, and partly in, the ground, and of material loosely yet symmetrically put together. Dimensions, 7 x 4 x 4 inches.

The eggs, which are laid each alternate day, are strangely overlaid with uniform dark chocolate. Nature has certainly provided ample protection to the bird through its habit and colour, to the nest in the manner of its position, and, as if these two were not sufficient, to the eggs in simulating the colour of their surroundings. Even a fox, that finds the *Sericornis*' nest and devours its contents, will need to use more than its powers of sight to be successful in finding that of the Ground-Tit. The young birds early assume the garb of their parents.

Nest.—Dome-shaped, side entrance; placed upon the ground in a slight depression, and covered with mosses to appear like its surroundings, built of grass, and lined with feathers.

Eggs.—Three or four to a clutch; much swollen; bright chocolate appearance, no spots. Length, 0.75 inch; breadth, 0.6 inch.

GRASS-BIRD

(LITTLE GRASS-BIRD),

Megalurus gramineus, Gld.

Meg-a-lur'us gra-min'e-us.

Megas, great; *oura*, tail; *gramineus*, pertaining to the grass.

SPHENEACUS GRAMINEUS, Gould, "Birds of Australia," fol., vol. iii.,
pl. 36.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—General appearance brown; fore-neck and lower throat more or less clearly streaked with dark brown; secondaries black, edged with buff; tail feathers graduated. Tail 2.5 inches, longer than wing. Total length, 5.75 inches.

THIS little bird, leading the quiet, retired life of a recluse, is a little known form, though well dispersed over the continent. Its reserved habits convey the impression that it exists only in scanty numbers. Unless one goes through the scrub or rank grass, and actually forces them to rise and fly a few yards beyond, the presence of the bird will not become evident by sight. I have waded into creeks and explored for many of their nests, yet I have never seen a bird except under these circumstances. In fact, it was years before I traced correctly the weird call of the little bird. Sportsmen who hunt swamps, and cow lassies who bring in their kine, hear the uncanny monotone of some little animal in the distance, without being able to trace the source of it. To further demonstrate the quiet life of the species, I have examined thousands of birds' eggs in boys' collections, and on one or two occasions only have I met with the eggs of this bird. I use the present opportunity to tell the boys it is a barbarous habit to take birds' eggs unless they are collecting for the local museum. Such there should be in every hamlet, in order that one may

know the animals and plants, useful or noxious, of the district.

The name "Stench-bird" has been applied because of an offensive smell it is said to emit. Personally, my nose has



Grass-bird.

not detected any objectionable aroma, but game dogs quickly trace the bird by its scent.

Nest.—Suspended in rushes growing in water; dome-like;

entrance near top; deep; built of grasses, lined internally with feathers.

Eggs.—Four to a sitting; ground colour flesh white, minutely freckled with red, varying in intensity in different sets. Length (much longer than broad), 0.75 inch; breadth, 0.5 inch.

REED-WARBLER,

Acrocephalus australis, Gld.

Ak-rō-sej' a-lus âs-tra'lis.

Akros, summit (a reference to the bill of the bird), a pointer; *kephale*, a head; *australis*, southern.

ACROCEPHALUS AUSTRALIS, Gould, "Birds of Australia," fol., vol. iii., pl. 37.

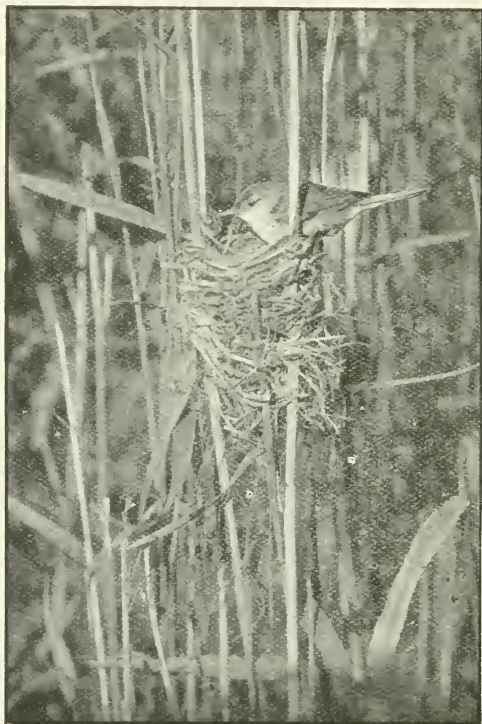
GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7.

KEY TO THE SPECIES.—General colour brown to olive-brown; bill large, depressed and broad at base, with moderately developed rictal bristles; third primary longest, the second equal to or longer than the sixth; wing 3 inches in length; culmen, 0.75 inch.

THE present bird is well dispersed over the sedgy lagoons and rivers of the eastern portion of the continent. The law of representation has placed a second species of the genus upon the similar water-places of the western State.

The Reed-Warbler and Grass-bird live peaceably together in the same reeds, though they are of opposite natures in many respects. The former whistles in the day, richly and harmoniously, just as it does in the night, builds an open nest, lays plain eggs, and lives in water reeds. The latter calls weirdly at night, and is quieter in the day, builds a side-entranced nest, lays brightly coloured eggs, and lives at

times in reeds (generally when breeding) and in other months in the dry, swampy bushes, not directly in the creek, but in the winter overflow. The food of the Reed-Warbler is largely insects. Lessees of river frontages benefit by the



Reed-Warbler and Nest.

incursions of the young and old birds in search of provender, The young in the early phase assume the dress of the parents. a rule not usual among birds. To secure the illustration necessitated Mr. Mattingley standing in the one spot in the

reeds for over seven hours. The bird was intensely suspicious of the camera, although well covered with reeds. Between leeches and blood-poisoning the photographer had an unhappy time.

Nest.—Placed in reeds or suitable grasses growing in the water, attached to three or four stems; open, cup-shaped, deep, made of grasses and lined with finer grasses. The plate illustrates the shape and position.

Eggs.—Four to a clutch; ground colour tawny, thickly blotched and spotted with umber and dense brown, as well as markings of a pale olive, appearing as if beneath the surface. Length, 0.7 inch; breadth, 0.5 inch.



PART IV.

INSECT AND FRUIT-EATING BIRDS.

ALL animals live along the line of least resistance, and surely we will understand that in thirsty weather fruit will lead some birds along this line.

Like other animals, they are very much governed by their surroundings, and when one observer will record such a species as the common Red-wattle Bird as a pest, a second, in another district, will say it is a bird practically harmless to the orchardist. Even so, there are members of the feathered class that show a distinct partiality for native fruits. It is among the birds mentioned in this section that growers cannot expect to find any resistance to so strong a temptation as that given by the culture of choice fruits close to their natural haunts.

If it is our duty, in the interests of self-preservation, to treat the birds enumerated in this part more severely than the preceding ones mentioned, I am strongly of opinion that a great slaughter is an undesirable disturbance of the balance of nature. The most effectual method is a severe punishment administered on the spot where the fruit is growing. To shoot or poison birds away from the place of transgression is, in my opinion, little better than whipping a dog hours after it has committed and probably forgotten a wrong.

The inclusion of Honey-eaters amongst the birds known as insectivorous and frugivorous needs a word of explanation. When there is honey, it is preferred by this family before anything else ; when there is none, the next move is in favour of fruit ; and if this has gone, insects, large and small, are resorted to.

The Cuckoo-Shrikes and Silver-eyes are spoken of in very strong English by the majority of growers during portions of the summer months. Yet, if one presses intelligent growers to admit a knowledge of their habits during ten months of the year, one will find, as I have found, that when weighed in the balance the scale in the bird's favour goes down at once and heavily. No one person or thing in this world gets all of any one way—neither the bird, the grower, nor the grown ; and it is a fact that, while all parties appear to demand individual rights, one from the soil and the others from the garden, they are indispensable to each other in the working out of the great scheme.

Australia has no bird that proves so disastrous to rural industries as the introduced Sparrow. A law for its stringent suppression should be a satisfactory one. Everywhere birds that keep in subjection untold millions of creatures during the year naturally expect a change of diet in three months of it. They have earned it, and get it if they can. Growers are not bound to give it, but for their own broad interests they should destroy them to as small a degree as possible. Strong provision should be made to frighten the great bulk of the birds away from the gardens at “ripening” time, but at that time only.

SATIN BOWER-BIRD

(SATIN-BIRD),

Ptilonorhynchus violaceus, Vieill.

Til-ō-nō-ring'kus vī-ō-lā'shius.

Ptilon, a downy feather ; *rhunchos*, bill ; *violaceus*, of a violet colour.

PTILONORHYNCHUS HOLOSERICEUS, Gould, "Birds of Australia,"
fol., vol. iv., pl. 10.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4.

KEY TO THE SPECIES.—*Male*—Purplish-black ; bill higher than broad at nostrils ; nostrils entirely covered with silky feathers, dense and recurved. Total length, 12.5 inches.

Female—Greyish-green on upper surface ; under surface lunated.

THE Bower-birds collectively constitute a beautiful and interesting sub-family of our native fauna, assisting to make the Australian region, so full of strange and novel forms, stand apart from all other regions as regards animal life.

A moment's glance at the members of this sub-family discloses ten species inhabiting our continent, one frequenting the heavy timber of the eastern coast as far south as Bass Straits ; two along the coast north of the Clarence River ; and the remainder broadly scattered through the hot, dry areas of the back country. They exhibit a wonderful variety of colouration. One is conspicuously marked by a lilac-pink neck ; another is clothed in the richest of yellow and black feathers ; a third handsomely spotted ; and a fourth perfect in its shining satin-blue coat.

The Satin Bower-bird confines its habitat to the humid lands of the south-east, associating in small flocks during the cold months in the vicinity of rivers. It is a shy bird, and, as a general rule, stationary, but, like most birds, it will move

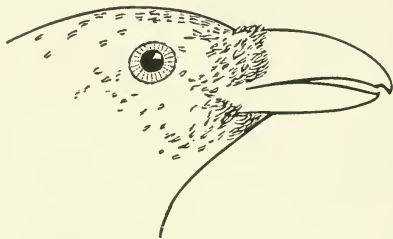
about according to the food supply. Native fruits form the bulk of its diet, though, at the same time, it is fond of the cultivated varieties. I am informed that Satin Bower-birds daily feed upon the fruit of pittosporum trees, apparently with keen enjoyment, whilst Sparrows that had indulged in the same diet are often found on the ground beneath the foliage quite stupefied, presumably from the effects of eating this fruit.

It takes many years for a male bird to get the glossy plumage, and this is possibly why one seldom sees more than two black males in a flock of fifty greenish birds. The call of the Satin Bower-bird seems to proceed from a depth in the bird's throat, and resembles the distant roll of machinery.

All Bower-birds agree in so far as they all build playgrounds—the so-called baby cradle of the Aborigines. The playground and its accompanying bower, from which the sub-family gets its name, reveals a development of the æsthetic quality rare even in birds. The bower is a structure built of sticks and twigs, buried at the lower end in the soil and interwoven at the top to form a rough arch about 2 feet in height. The appearance is like that of the half segment of a drain-pipe with the domed portion uppermost. At each end of this bower the birds heap up brightly-coloured berries, pieces of broken glass, white bones, or any bright objects they may find in the bush. In this gaily decorated structure, which is generally well hidden in a thicket, the sexes meet—the male to sport his finery and the female to admire the antics of her partner. Running in and out of the bower they disport themselves to their hearts' content, playing and gambolling just like a pair of cats.

My esteemed correspondent Mr. Graham had a tame male bird which he considered to be a weather prophet. Mr. Graham writes :—"Twenty-four hours prior to rain or a change,

Jack' shows an agitation that is painful to look at. When clearing for fine weather, and about as quickly as the barometer gives the information, he is all serene. 'Jack' is fond of small and large grubs, for, when I let him out some three months ago, my garden was badly infested with white slugs.



Head of Satin Bower-bird (nostrils hidden).

The slimy pest soon disappeared. 'Jack' introduced a friend of his kind to the garden, but it had bad manners, because no sooner had it arrived when it must start mischief among the fruit-buds." One might take a hint from the information given above—that is, Bower-birds might be of considerable use in a garden if the wings be cut so that they cannot fly into the fruit trees.

The Greek word *Ptilonorhynchus*, meaning feathered bill, refers to the bird's feathered nostrils. These organs in the Spotted Bower-birds, on the contrary, are bare.

Nest.—Open, and placed high in a sapling or other tree; made of twigs, and lined with finer twigs, &c.

Eggs.—Two to a sitting; long ovals; rich cream, spotted or blotched and dotted with sienna-brown. Length, 1.75 inches; breadth, 1.15 inches.

SPOTTED BOWER-BIRD

***Chlamydodera maculata*, Gld.**

Klam i-dod'e-rä mak-u-la'tü.

Chlamus, a mantle; *dera*, neck; *maculatus*, spotted.

CHLAMYDERA MACULATA, Gould, "Birds of Australia," fol., vol. iv.,
pl. 8.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 6, 7, 9.

KEY TO THE SPECIES.—*Male*—Band of bright lilac feathers on nape; upper surface mottled all over with reddish spots or bars at tips of feathers; throat and sides of body with spots or bars of brown; head rufous-brown, slightly varied with spots.

Female—No lilac band; flanks barred with dusky; throat light reddish or tawny, slightly varied with dusky-brown cross-bars and edges to feathers.

WHILE the Satin Bower-bird frequents the humid areas of south-east Australia, the Spotted species is to be found in the drier back country. Both species extend their distribution in a northerly direction, each, however, keeping to the class of country it loves best, marked out by the different aspects presented by the flora and fauna.

The Spotted Bower-bird is an exceedingly shy species, and apparently possessed of a bad temper, for, if disturbed whilst at play in its bower, it will fly rapidly from tree to tree, making a great fuss, and uttering its hard, raucous notes, as though scolding the intruder.

The bower of this bird, like that of the previously-mentioned species, is a wonderful example of ornithological architecture, surpassed only in design and workmanship by the bower of the New Guinea Amblyornis. One bower I found near the junction of the Murray and Darling Rivers, elegantly decorated with bright quandong fruit, pieces of broken bottles, and bleached bones of small animals, was built amongst the myalls,

and nicely hidden beneath low overhanging branches. Its length was about two feet, and height ten inches, the top edges slightly overlapping.

It is asserted by some observers that this bird is the greatest pest the orchardist has to contend against, should his property border a brake of scrub resorted to by the pillager. Though it is a suspicious, shy, and wary bird, it is also a bold one, as evidenced by the coolness with which it will dash into a fruit tree within a few yards of the spot where a man may be working, calling out defiance in a very brave, almost impudent, way. Yet the slightest hostile movement will cause it to vanish like magic.

The food of the Spotted Bower-bird is partly composed of insects, varied in the season by garden produce such as tomatoes and chilies, the latter being swallowed whole, so as to obviate the unpleasant hotness. In Queensland they favour small fruits of a bright colour, such as guavas, to the detriment of the grower.

The generic name *Chlamydodera*, terrifying on first acquaintance, explains the leading character of the bird. It is derived from two Greek words, meaning mantled neck, and refers to the bright lilac feathers which form a kind of mantle around the neck.

Nest.—Similar to the preceding one.

Eggs.—Two to a sitting; much streaked and marked with blackish "hieroglyphics" over a pale greenish ground. Length of an ordinary specimen, 1.5 inches; breadth, 1 inch. It is a handsome egg, and marks a beauty spot in the magnificent collection of Australian birds' eggs in the possession of Dr. Charles Ryan.

SOOTY CROW-SHRIKE

(BLACK MAGPIE),

***Strepera fuliginosa*, Gld.**

Strep'e-rä fu-li-ji-no'sä.

Strepo, to make a noise ; *fuligo*, *fuliginis*, soot.

STREPERA FULIGINOSA, Gould, "Birds of Australia," fol., vol. ii., pl. 43.

GEOGRAPHICAL DISTRIBUTION.—Areas 4, 5, 6.

KEY TO THE SPECIES.—General appearance sooty-black ; wing quills with white tips nearly 1.5 inches broad ; under tail coverts blackish ; nostrils bare and placed high in the maxilla.

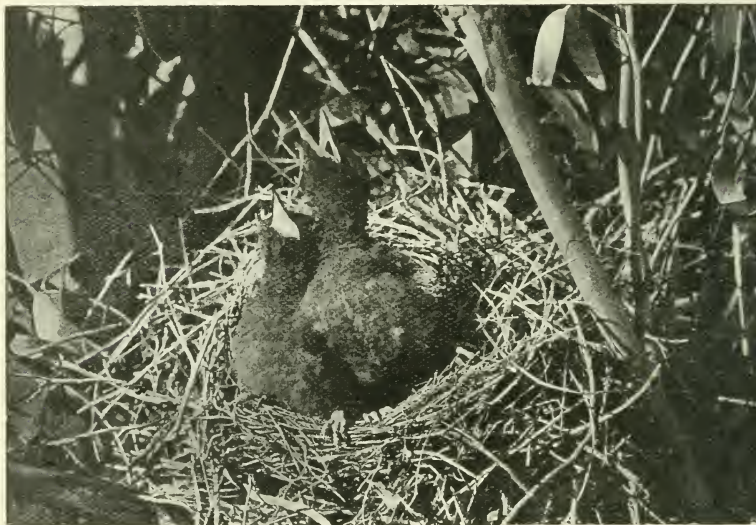
THE six species of *Strepera* are commonly known as the Grey or Black Magpie, according to the depth of sootiness in the plumage. Five are to be found in the southern half of the continent at all seasons of the year; and the sixth is a Tasmanian species. In Western Australia there is a sub-species of the grey variety.

This so-called Magpie is not to be confused with the *Gymnorhina*, which is a thoroughly useful bird, of good reputation, whilst that of the Sooty Crow-Shrike is a doubtful one, most growers considering it little less than a thief. Certainly the bird appears to be very sly, keeping its weather eye open to possible trouble whilst pillaging the orchard—an underhand action that is magnified into a crime by the chief sufferer.

The general habit of this species is to fossick for food upon low-lying grounds, or in the vicinity of river courses, where it can find insects and their larvæ with the least amount of labour. All the members of the genus adopt this means to get a living, and they have become thoroughly expert in their ground movements. In form there is a strong resemblance to the Crow, but in habits there is a great difference. The Crow-

Shrike is not a carrion-eater. Its relationship to the Shrike is more remote still, held only through the medium of the Magpie (*Gymnorhina*).

The *Strepera* lives very largely on insect food, but it also causes considerable annoyance to the orchardist. All Black and Grey Magpies are excellent eating, so, when killed, they should never be wasted.



Nestlings of Black-winged Crow-Shrike.

Dr. James Norton, writing in the *Agricultural Gazette of New South Wales*, 1897, remarks:—"The *Streperas* are generally classed among insectivorous birds, being, therefore, presumably friends of the fruit-grower, and no doubt they do eat a great many insects when they can get nothing more to their taste. About Springwood, at all events, they are more destructive to fruit than all the other birds put

together. They are wholesale devourers of apples, pears, peaches, plums, quinces, grapes, figs, and every other kind of fruit, including even unripe date plums, which one would have thought sufficiently astringent to disgust any bird. They are terribly destructive to maize, the sheaths of which, covering the young cobs, they strip back to enable them to pick off the sweet milky grasses just as they are ripening.



Black-winged Crow-Shrike, nestlings and adult.

They may be driven off by shooting, but soon return if not continually watched. They are particularly destructive to grapes, which they appear to swallow whole, and, notwithstanding the protection by nets, they manage to get at the fruit by searching carefully for any small opening which may be accidentally left, and even sometimes cut their way through the net itself. If the bunches be bagged they will look for a

small opening, and if present, make it larger with their bills. I have known them to tear their way through the bag, if not of strong material, and then at leisure devour every berry. Large fruit is generally cut to pieces and devoured as it grows, but it is sometimes carried off, after the manner of the common Crow, to a neighbouring tree, probably impaled on the bird's beak if too large to carry in the ordinary way. It seems strange that the Satin Bower-bird, the Oriole (*Oriolus viridis*), and other fruit-eating birds should often accompany the Streperas in their marauding expeditions, arriving and departing with them, and even mimicking their notes." Continuing his notes, Dr. Norton remarks:—"It is only fair to say that, though the Strepera is so terribly destructive in my neighbourhood, yet in other places he does little or no mischief, probably confining himself to an insectivorous diet, and adding the wild fruits, which he eats here when the garden fruit is gone, and among others that introduced nuisance, *Phytolacca* (ink plant)."

The plate illustrates the adult, young, and nest of the Black-winged Crow-Shrike, photographed by Mr. Mattingley on Kangaroo Island, South Australia.

Nest.—Open, and made of twigs, lined with finer twigs; placed in trees, between forks.

Eggs.—Three or four to a sitting; pale ruddy-brown, marked liberally with darker brown. Length, 1.5 inches; breadth, 1 inch.

ORIOLE

(OLIVE-BACKED ORIOLE),

Oriolus sagittatus, Lath.

O'ri-o-lus saj-e-ta'tus.

Aureolus, golden ; *sagitta*, an arrow.

ORIOIUS VIRIDIS, Gould, "Birds of Australia," fol., vol. iv., pl. 13.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4.

KEY TO THE SPECIES.—Breast streaked ; abdomen white, broadly streaked with black ; upper surface olive, sometimes green ; lores feathered ; bill with a notch in the upper mandible ; nostrils placed well in front of the base of the bill and quite bare ; iris scarlet. Total length, 10 inches.

THE two certain species of Orioles are found only on the eastern coast of our continent ; one, the northern species, keeps to the upper half, and the other, the present form, stays in the southern part. It is a fairly plentiful bird, and in size it is a shade larger than the common Myna, or a little shorter than the Rosella. I am not certain whether or not it leaves southern Victoria during winter for the warmer parts, though I have known it to arrive in this southern State in advance of spring. Those inhabiting the upper part of New South Wales appear also to winter there.

The voice of the Oriole is sometimes imitative of the Cuckoo-Shrike, though it pitches the first note in a higher key than this bird. Mr. Gould observes :—"The note of this Oriole is melodious and varied. It may often be seen perched on some shady tree, with its head thrown back, thus showing to perfection its mottled breast, and singing in a low tone imitative of the notes of many birds, including the Silver-eye, and particularly the black or fruit-eating Magpie. While feeding, it frequently utters a harsh, guttural sort of squeak.

During the breeding season, which commences at the end of September and ends in January, it confines itself to a very monotonous, although melodious, cry, the first part of which is quickly repeated and ends in a lower note."



Oriole.

Dr. Ramsay, in *The Ibis*, 1893 volume, writes :—" During the winter months these birds may be found in flocks of from five to twenty in number, feeding upon various cultivated and wild fruits, and often in company with the fruit-eating Magpie

(*Strepera*), the note of which they often imitate. They frequent nearly all the orchards and gardens about Sydney, especially if they contain any of the native olive or Moreton Bay fig trees in fruit, to which they are very partial. I have known them, though seemingly with great reluctance, eat the berries of the white cedar. Towards the beginning of September those near Sydney pair and seek for breeding places, each couple selecting a distinct locality, where they remain during the whole of the season; even if the nest be taken, they will, like the *Grallina australis*, continue building near the same place until the season has expired."

There is a divergence between the Orioles of the mainland and those of the Malay Archipelago, as noted by Mr. Wallace, and interesting as a case of protective mimicry. The two species of the islands unconsciously mimic the Leatherheads (*Philemon*), and thus lead birds of prey to believe they have to deal with the pugnacious Leatherhead instead of the harmless bird under notice.

Nest.—Open and suspended to a swaying branch; built of grasses and leaves, lined internally with soft materials; diameter about 4 inches.

Eggs.—Three to a sitting, generally; the ground colour is cream, over which are umber and brown spots, and faint lilac marks appearing as if beneath the surface. Length, 1.25 inches; breadth, 0.9 inches.

FRIAR-BIRD

(LEATHERHEAD, FOUR-O'CLOCK),

Philemon corniculatus, Lath.

Fi-le'-mon kôr-nik-u-la'tus.

Phileo, to love ; *philemon*, loving ; *cornicula*, a little horn.

TROPIDORHYNCHUS CORNICULATUS, Gould, "Birds of Australia," fol., vol. iv., pl. 58.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6, 7.

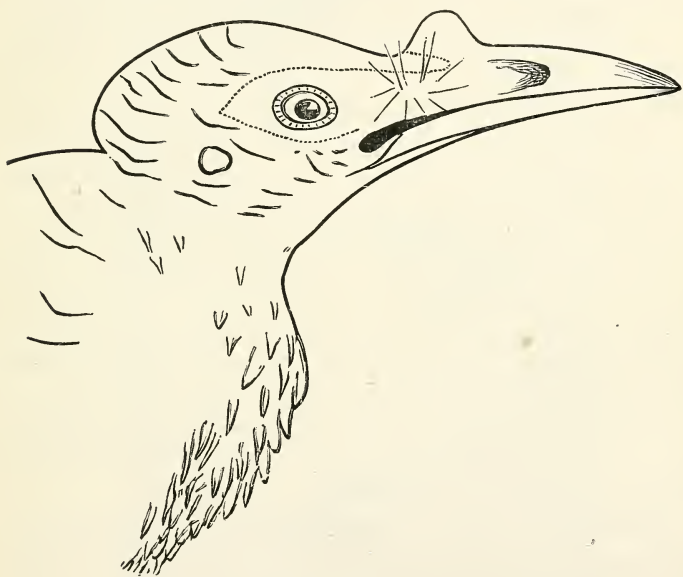
KEY TO THE SPECIES.—Base of culmen with large hump ; whole crown, side of neck, and head all round bare ; feathers of fore-neck and chest lanceolate in shape.

THIS is the common Leatherhead. I have never seen the Queensland and New South Wales species (*P. citreogularis*) come as far south as the Murray River, but I have no doubt it is numerous enough at times in the direction of Mildura and Renmark. There are four species of Leatherheads on our continent.

Mr. Gould writes of this species :—"The Friar-bird, selecting the topmost dead branch of the most lofty tree whereon to perch and pour forth its garrulous and singular notes, attracts attention more by its loud and extraordinary call than by its appearance. From the fancied resemblance of its notes to those words, it has obtained from the colonists the various names of 'Poor Soldier,' 'Pimlico,' 'Four-o'clock,' &c. Its bare head and neck have also suggested the names of 'Friar-bird,' 'Monk,' 'Leatherhead,' &c. The flight is undulating and powerful, and it may frequently be seen passing over the tops of the trees from one part of the forest to another. While among the branches it displays a more than ordinary number of singular positions, its curved and powerful claws enabling it to cling in every variety of attitude, frequently hanging by one foot with its head downwards, &c.

If seized when only wounded it inflicts with its sharp claws deep wounds on the hands of its captor.

The food consists of eucalyptus pollen and insects, to which are added wild figs and berries. The growers of fruit for the London market will not listen with good grace to Mr. Gould's remarks on the food of this bird, because they, together with those in other districts, have considerable trouble with it. It is a very aggravating bird just previous and subsequent to Christmas time.



Friar-bird.

Nest.—Suspended from a branch, with a part of the edge fixed in the fork of it. Grasses and bark make up the structure, with fine grasses within.

Eggs.—Three to a sitting; long; ground salmon colour, blotched with slaty-grey and pale chestnut. Length, 1.25 inches; breadth, 0.8 inch.

YELLOW-FACED HONEY-EATER,

***Ptilotis chrysops*, Lath.**

Ti-lō'tis krī'sops.

Ptilon, a downy feather ; *ous*, *otos*, the ear ; *chrusos*, gold ; *ops*, face.

PTILOTI CHRYSOPI, Gould, "Birds of Australia," fol., vol. iv., pl. 45.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 6.

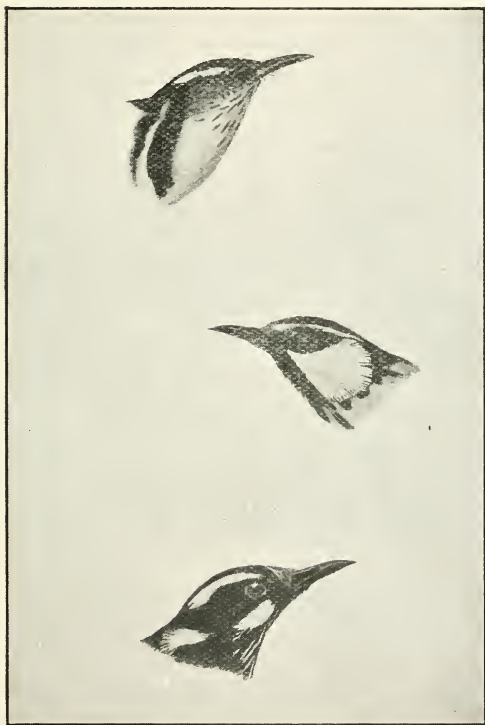
KEY TO THE SPECIES —General appearance brown ; ear coverts yellow ; small white auricular patch ; black streak through eye ; cheeks black ; under parts with dull streaks ; upper parts earthy brown.

THE Leatherhead, the Lunulated or Black-headed, and the Yellow-faced are the Honey-eaters that make themselves a nuisance to growers of fruit. In the ornithology of this continent the honey-eating family contains the largest number of species. That eminent ornithologist, Mr. John Gould, was very happy in claiming for the Meliphagidæ the place in the avifauna of Australia held by the eucalypts in the flora. Plant and animal are closely associated, for, where a quantity of flowering gums are growing, so surely will the Honey-eaters be represented by one or more species. When there are not any blossoms on certain trees the birds will seek further afield, or, if necessary, will subsist on insect life until such time as nature provides the nectar-pots.

The question of what constitutes the family of Meliphagidæ is an open one, being rendered so by the varied opinions held by five leading systematists in London. The bone of contention is whether the *Zosterops* (Silver-eyes), of which there are 88 species known, should or should not be included in the family. Dr. Gadow favours their entry.

Of Honey-eaters, generally recognized as such, there are some 150 known species confined to the Australian and New Zealand regions, though with scanty representation in the

latter. With one exception, they are altogether placed in these areas, and it is not so very surprising that this wanderer should get from Lombok to the island of Bali; rather the wonder is that the north-west boundary of geographical range should be so faithfully kept by the birds.



Upper fig., Crescent Honey-eater; middle fig., White-cheeked Honey-eater; lower fig., New Holland Honey-eater,

If the view be held that the Silver-eyes form a part of the family, then the two regions named will lose the family as one

peculiar to the areas, for it then starts its most western line of habitation in South Africa, working northward to China, and south from there to New Zealand, closely traversing the intermediate countries. If we include the Silver-eyes, of which there are six species in Australia, we find our continent and Tasmania have seventy-five species of Honey-eaters. Thirty-seven of these are recorded for the extreme south-east, and nearly all are decidedly useful birds, if not entirely insectivorous. The New Holland species, its nearest of kin, the Crescent, and the White-cheeked species are insect-eating as well as being true Honey-eaters.

The Yellow-faced Honey-eater is strongly attracted by the working of a pioneer's lease, and, if satisfied that fruit is one of the products, decides to stay. To do the bird justice I might say its diet is strongly composed of insects in the winter, when most of the bad characters are, from a human standpoint, on their best behaviour.

Nest.—Cup-shaped and suspended; made of grasses and covered with mosses; position near the ground.

Eggs.—Two or three to a sitting. The colour varies considerably, but it is generally a pale salmon, with spots of chestnut-red and greyish-purple. Length, 0.75 inch; breadth, 0.5 inch.

RED-WATTLE BIRD

(WATTLE-BIRD),

Acanthochæra carunculata, Lath.*A-kan-tho-ke'rä kã-rung-ku-la'tä.*

Akantha, a spine (a thorn); *chæra*, representing a genus of perching birds (Passeres); *caruncula*, a fleshy excrescence.

ANTHOCHÆRA CARUNCULATA, Gould, "Birds of Australia," fol., vol. iv., pl. 55.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6, 7, 9.

KEY TO THE SPECIES.—A long, greyish bird, with longitudinal white marks upon the plumage; wattles $\frac{1}{2}$ -inch long and blood-red; tail graduated, as long as wing (about 6 inches); bill same length as head; nostrils longitudinal and operculated.

THE Red-wattle Bird or Wattled Honey-eater is evidently a desirable dish, for it may be seen for sale at any poulterer's in or out of season.

In Tasmania there is a close ally, easily distinguished by the possession of wattles one inch in length—that is, double the length of this appendage in the mainland species. There are two other so-called Wattle-birds, the Brush and the Lunulated, differing from the previously named species in the absence of wattles.

The present species has a wide vocabulary, ranging from an unpleasant guttural noise to one less harsh, and pleasant to a limited degree only. When the young begin to call, there is little to choose between the sound from the practised larynx and the one undergoing the tediousness of a lesson.

The length of the youthful bird as it leaves the nest is nine inches, and that of the parent fifteen inches. As the tail grows in length, there are co-ordinate variations in the general plumage—the light brown of the young changing to the whitish markings of the adult.

On the 16th May, 1896, a spot immediately north of Bass Strait was the scene of a gathering of the Red-wattle Bird for migration into higher latitudes. Thousands of individuals composed the flock, which flew overhead in groups, receiving accessions to their numbers hourly. A young friend saw these birds return to this spot at 3 p.m., after an absence of six hours. When all had assembled, they arose in a body, circled round, returned, and finally, all arrangements presumably being made, flew off, not to return for a season. However, the whole body of birds in the district did not go off with this force, for six weeks later I saw two on the same ground, apparently in good health.

In the same month, but a little west of this point, near the town of Colac, in Victoria, an enormous flock, estimated to number a million individuals, gathered together in preparation for the migration to warmer latitudes for the winter. It seems as though the whole Tasmanian and Victorian forces had collected their units for the journey through New South Wales into Southern Queensland. It would be interesting to discover the course followed by the South Australian birds in their annual journey northwards. I commend this point to the notice of the ornithologists of this State.

Nest.—Open, loosely constructed of twigs, and lined internally with hair, fur, &c.; placed near the ground, and generally in a fork.

Eggs.—Three to a sitting; ground colour salmon-buff, with chestnut markings upon it; slaty-grey markings below the surface. Length, 1.25 inches; breadth, 0.8 inches.

LUNULATED HONEY-EATER

(BLACK-HEADED HONEY-EATER),

Melithreptus lunulatus, Shaw.

Mel-i-threp'tus lun-u-la'tus.

Mel, honey; *threptos*, nourishment; *lunula*, a little moon.

MELITHREPTUS LUNULATUS, Gould, "Birds of Australia," fol., vol. iv.,
pl. 72.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 6.

KEY TO THE SPECIES.—Crown of head black; white crescentic band across occiput; under surface white; naked space above eye scarlet; wing, 2.75 inches to 3 inches in length; bill shorter than rest of head.

THE Lunulated Honey-eater is a species commonly found in the south-eastern portion of the continent—broadly speaking, in the country east of a line drawn from Adelaide to Brisbane.

It is one of the most active of the family, flying from tree to tree with astonishing speed, and, moreover, its performances as an acrobat are by no means to be despised. It seems to fall from one bough to another with unerring aim and little effort, and if while in a pendent position it can reach a desired position a few inches below by a somersault, it does not hesitate to perform this acrobatic feat, immediately on landing proceeding in its search for food, or perhaps engaging in battle with a rival, without loss of time.

The nests are cup-formed structures, neatly built and usually carefully hidden in the topmost bough of the highest branch of a tree. One I found to be almost completely lined with a layer of sheep's wool and ornamented exteriorly with wool taken for the purpose from a house near by. Eucalyptus trees are the favourite positions for the nest as well as for the hunting ground for its food.

Fruit, both native and introduced, strongly tempts young and old birds alike, though it is a considerable time before they care to investigate trees bearing fruits they have not been



Noisy Minah.

accustomed to eat. This little bird carries a “moon” on its neck—one in the first quarter.

The Noisy Minah (*Manorhina garrula*) is another Honey-eater that is not very high in the estimation of our people.

Nest.—Cup-shaped and suspended ; made of grasses, with a few spider cocoons attached to the exterior. It is generally placed high in a eucalypt.

Eggs.—Two or three form the sitting ; ground colour tawny, with reddish spots, which may form a zone. Length, 0.75 inch ; breadth, 0.5 inch.



PART V.

INSECT, NECTAR, ^{AND} FRUIT-EATING BIRDS.

How birds affect the orchard or farm is little understood in its true light. "Economically considered birds are simply natural forces, and it should be our purpose to ascertain how they may be turned to our greatest advantage. The best economic conditions are probably fulfilled when birds are numerous as species and moderately abundant as individuals. Under such conditions there will be a demand for food of many kinds without excessive demand for any one kind. The most desirable status would seem to be such a relation of numbers and species between birds and insects that the birds would find plenty of food without preying on useful products, while the insects would be held in such check that they would neither increase to a harmful extent nor be completely exterminated. The proper course to pursue, apparently, is to study the food habits of both birds and insects, to favour the increase of species which seem best adapted to preserve the proper balance, and to reduce the numbers of those that prey too greatly on the products of orchard or farm."*

* "Year-Book of Department of Agriculture, 1900."

One part of a certain section of the class Aves appears to perform services of little direct value to growers, yet indirectly such services, though much underrated, are by no means feeble. I refer to the Parrot tribe, which may be divided into (a) brush tongues, (b) tongues without brush.

Division (b) has little to be said in its favour that calls for special mention, but that little may be noticed under the two subdivisions—(b I.), Cockatoos which frequent the agricultural areas, and are more or less hurtful; (b II.), Cockatoos which frequent the heavy timber adjacent to certain fruit-growing areas, and which are beneficial.

The division (a), of which certain Lories—the Musky (*Glossopsittacus concinnus*), Shaw; the Little (*G. pusillus*), Shaw; and the Purple-crowned (*G. porphyrocephalus*), Dietr.—form the backbone, is of much more interest to us. It is the portion in which are included the great mass of Parrots that visit us annually, and cause so much annoyance and loss in the fruit crops; but as a counterbalance it is the portion that does an infinite amount of good as scale and coccid eaters. In well-wooded country such birds will be needed to patrol the forests and lightly timbered lands for a century to come.

The use of the brush tongue possessed by the birds in section (a) is to gather nectar from the “honey-pots” of the eucalypti. When there are no blossoms, the use of the brush tongues is partly discarded, but the birds are so well informed that they know scale-insects contain a large amount of “honey-dew,” and for the remainder of the season largely prey upon them. In this respect they differ from section (b), although not radically, as the Rosella has been known to clear many branches of the parasites.

In support of section (a), generally speaking the greatest of the native bird enemies of the orchardist, I cannot do better than draw attention to a paper by Mr. D. M'Alpine on

the relations between the Lory and the fungus of the citrus tree :—

“Mr. J. G. O. Tepper, of Adelaide, has shown me,” writes Mr. M’Alpine. “how the destruction of honey-eating birds may affect the sooty mould of citrus trees. It may be mentioned that it appears to have been practically absent when nature was less disorganized by man, and for a very simple reason. Being due to the sugary exudations of scale-insects, &c., coating the trees, its abundance depends upon that of its producers, and this upon the reduction of the sugar-loving brush-tongued Parrakeets and other birds, which formerly abounded so greatly. These I have often observed busy in the early morning among the foliage of gums, &c., upon which honey-dew appeared. Later in the day the ants occupied these in overwhelming numbers, and drove the birds away, protecting the insects and cleaning the foliage.

“The complex relation seems to be in the following form :—

“1.—The scale or other insects are used directly to attract the ants by their sweet secretions.

“2.—The ants, like a standing army, protect the foliage against the attacks of leaf-eating animals.

“3.—The abundance of honey-eating birds is necessary to keep the scale or other insects within reasonable bounds.

“4.—The reduction of these birds by man tends to favour the increase of the scale-insects and their produce.

“5.—The scale and other insects now get the upper hand, and the ants, protecting the insects, also favour their increase.

“6.—The consequence is superabundance of honey-dew, and this is taken advantage of by the germs of the fungus to spread and multiply.

“Thus the destruction of the honey-eating birds has brought about an increase of the honey-dew and of the sooty-mould, which lives upon it, so that it is not only insectivorous birds which ought to be protected for the benefit of the grower.”

The conclusion of the whole matter appears to me to be that it is better to individually battle in the gardens rather than collectively to go abroad to war. Whatever means we use at home are necessary—in the first place to make them fear us through simple fright, or in the second place to cause them to dread us by killing many of their number. Various means might be adopted, as with the Crow.

Psittaci, so named by Ritgen in 1826, and now generally adopted, has its greatest diversity of types in the Australian region, but the largest numbers in the neo-tropical (South America). Excluding the thorough globe-trotters (Plover-like birds), Parrots are reckoned as great an order of vagrants as any of the class, following as they do the flowering of the eucalypts from the low to higher latitudes. Of over 500 known species, 63 are Australian. Of these about 45 are to be found in the south. The following list will give an idea of the outline classification of the order, the first three being families (*idæ* termination), the last two sub-families (*inæ* termination):—

1. Cacatuidæ—Black Cockatoos, 7 species; White to Rose-tinted Cockatoos, 7 species; Grey Cockatoos, 1 species.

2. Loriidæ (Brush-tongued Parrots)—7 species; *e.g.*, Musk Lorikeet.

3. Cyclopsittacidæ (Fig Parrakeets)—2 species; habitat in Queensland. Family Psittacidæ.

4. Palæornithinæ (“Merry-thought,” furcula, present)—6 species; *e.g.*, King Lory.

5. Platycercinæ (“Merry-thought” bone absent)—33 species of broad-tails; *e.g.*, Rosella.

MUSK LORIKEET

(GREEN 'KEET, MUSKY PARRAKEET).

Glossopsittacus concinnus, Shaw.

Glo-sop-sit'a-kus kon-sin'us.

Glossa, tongue ; *psittakos*, a parrot ; *concinnus*, compact (pretty).

TRICHOGLOSSUS CONCINNUS, Gould, "Birds of Australia," fol., vol. v.,
pl. 52.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7.

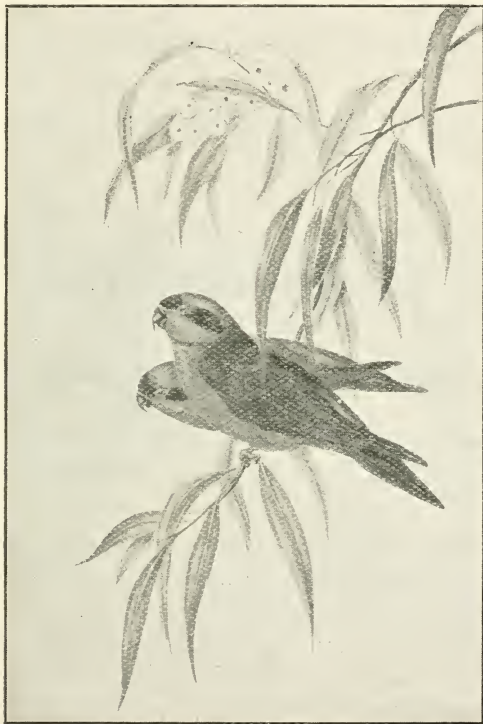
KEY TO THE SPECIES.—General colour green ; no red on cheeks ; ear
coverts red, like forehead ; bill black.

THIS species is widely distributed along the eastern side of Australia and Tasmania. My experience of the bird leads me to speak of it as an overhead species, for we get our first impressions through the ear high in the air. To get a view of the screeching flock it is necessary to look up quickly, for their flight is so rapid as to carry them beyond our vision in a very short time.

Possessing a brush tongue in addition to a hard biting bill—so necessary in the attack upon hard fruits, &c.—it holds a considerable advantage over other members of the group.

I seldom notice the birds in the southern parts between the middle of May and the end of August, but on the 19th of July, 1898, I heard one skyward. The summer of 1897–1898 was particularly hot, the weather being very warm in April, particularly mild in winter, and with every indication at the end of August of an early summer, so that the Musk Lorikeet remained throughout the year. With a hot season and plenty of nectar blossoms, how it does enjoy life ! Having shot a specimen one day, I held its head down, and the honey streamed and dripped from its throat for nearly a minute. The eucalypts act as "foster-parents" in January. In the

warmer portions of the colony it attacks, in great force, fruit trees, and leaves their fruit in a most unsatisfactory state, unless carefully guarded—a guard that is tedious and costly. The birds are so tame that nothing short of wholesale



Musk Lorikeet.

slaughter—a most undesirable proceeding—seems to keep them away from orchards.

In the spring the flocks break up into pairs for the rearing

of young, coming together again as a noisy mob in the late summer.

The Purple-crowned Lorikeet very much resembles the Musk Lorikeet, but may readily be distinguished by the purple crown. It is not a common bird in the extreme south, and only comes with specially hot seasons.

Nest.—In a hollow of a tree; dust alone is used upon which to place the eggs for incubation.

Eggs.—Four or five to a sitting; white; round. Length, 1 inch; breadth, 0.75 inch.

LITTLE LORIKEET

(LITTLE GREEN 'KEET),

Glossopsittacus pusillus, Shaw.

Glo-sop-sit'a-kus pū-sil'us.

Glossa, tongue; *psittakos*, a parrot; *pusillus*, very small.

TRICHOGLOSSUS PUSILLUS, Gould, "Birds of Australia," fol., vol. v., pl. 54.

GEOGRAPHICAL DISTRIBUTION.—Areas 2, 3, 4, 5, 6, 7.

KEY TO THE SPECIES.—General colour green; cheeks,*forehead, and chin all round the base of bill red.

THIS rapid flier is the most diminutive of the Australian Parrots. It associates with the Musk Lorikeet in great numbers, and may be heard in February along the southern coasts.

It breeds in the north among the secret places of aged timber, and comes south with its family in the summer to see what can be secured in the open.

Like most of the Parrots, this tiny species is very fond of the gum trees, and spends much of its time among them.

Certain of the Parrots are grass-loving, and spend nearly all the day gathering seeds upon the ground. Such are the *Psephotus* (8 species) and *Neophema* (7 species) in general, with the Night Parrakeets (*Pezoporus* and *Geopsittacus*) in particular. Of these latter there is only one species to each of the two genera.

Nest.—A cavity in a large tree is used, and the eggs are placed upon the decayed wood.

Eggs.—Four to a sitting; white. Length, 0.7 inch; breadth, 0.6 inch.

ROSELLA

(ROSEHILL PARROT),

***Platycercus eximius*, Shaw.**

Plat-e-ser'kus eg-zim'i-us.

Platus, broad; *kerkos*, tail; *eximius*, excellent.

PLATYCERCUS EXIMIUS, Gould, "Birds of Australia," fol., vol. v., pl. 27.

GEOGRAPHICAL DISTRIBUTION.—Areas 3, 4, 5, 6, 7.

KEY TO THE SPECIES.—Cheeks white; head red; feathers of back edged yellowish-green; upper tail coverts green.

THE western and eastern sides of the continent have each its own Rosella; neither trespasses on the other's ground. The former bird has yellow cheeks, the latter white.

This, the eastern form, is almost too well known to need description. It is quite numerous at times, and very destructive among large fruit, as apples and pears. The trouble commences soon after the young begin to forage, and continues through the summer, or as long as any fruit remains upon the trees or ground. The hotter the day the more persistent the invaders, as if more moisture was necessary for

them during the great heat. During the winter and spring the Rosella gathers a living in the fields. The young birds appear for sale in our markets as early as the middle of November.



A Nest of the Rosella (opened out and photographed).

The old birds probably use the same hollow for three consecutive seasons, but it is a matter of some difficulty to recognize the same pair. The nesting of this species is usually

carried out in the hollows of trees. However, I have been told that it is a common occurrence to find nests in rabbit-burrows, and occasionally in the decaying tops of fence posts, owing to trees of a suitable nature being scarce.

Two short notes on this familiar bird may be interesting. The first is of a Rosella, aged 21 months, that is able to speak 36 phrases, words of exclamation, and sentences of six words. Twenty-three of these I was able to write down. It reminds me of Humboldt's story of the South American venerable Parrot, which was the sole possessor of a literally dead language, the whole tribe of Indians having become extinct.

The second note is on a bird which lived for two years without any feathers. My friend who kept this bird in captivity remarked to me that it seemed to be undergoing a severe moult when he got it, and it was still uncompleted when he gave it away two years later. With but a sprinkling of down and no feathers, it waxed strong and grew fat, and, despite the adverse circumstances, it was very active, if not happy. Every bird of this nature should be undergoing medical treatment for skin and blood trouble. The remedy is simple and cheap, and I mention it as a prevention of cruelty to animals, caused by injudicious feeding and improper environment.

The Rosella is a species distinguished by its broad tail and peculiar beauty.

Nest.—Hollows of trees are used, and the eggs are placed merely upon the decayed wood.

Eggs.—Five, six, or seven to a sitting; white. Length, 1 inch; breadth, 0.8 inch.

WHITE COCKATOO

(SULPHUR-CRESTED COCKATOO),

***Cacatua galerita*, Lath.**

Kak-a-tu'ä gal-ē-rī'tä.

Kakatua (Malay), imitation of the cry; *galerum*, a helmet.

CACATUA GALERITA, Gould, "Birds of Australia," fol., vol. v., pl. 1.

GEOGRAPHICAL DISTRIBUTION.—The whole of the Continent.

KEY TO THE SPECIES.—Body feathers white; crest yellow, the feathers being narrow and recurved; cere naked; skin round the eyes white.

THE largest white species of the Parrot family is known throughout the continent by means of its yellow helmet. There are several Cockatoos that are nearly all white, but this species is whiter than any other.

The late Mr. John Gould, in his early wanderings in this State, remarked upon the want of affection shown by farmers for this bird. He says:—"As may be readily imagined, this bird is not regarded with favour by the agriculturist, upon whose fields of newly sown grain and ripening maize it commits the greatest devastation; it is consequently hunted and shot down wherever it is found, a circumstance which tends much to lessen its numbers. It evinces a decided preference for the open plains and cleared lands rather than for the dense brushes near the coast; and, except when feeding or reposing on the trees after a repast, the presence of a flock, which sometimes amounts to thousands, is certain to be indicated by their screeching notes, the discordance of which may be easily conceived by those who have heard the peculiarly loud, piercing, grating scream of the bird in captivity, always remembering the immense increase of the din occasioned by the large numbers of birds emitting their harsh notes at the same moment."

In the heavy foliage and deep shadows the Cockatoos certainly sport "like spirits of light," but they seem to act like spirits of darkness in the wheatfield.

The illustration adjacent shows a flock of the white section of Cockatoos found occupying the dry open land of the back country. They are the Bare-eyed Cockatoos.

The food consists of seeds, grain, and bulbs. In captivity a Cockatoo will eat a miscellaneous lot, and say a deal in the process.

Nest.—A hollow at a high altitude in a large eucalypt is used, and the eggs hatch out on the dry dust.

Eggs.—Two for a sitting; white. Length, 1.5 inches; breadth, 1.2 inches.

We have strong evidence to show us that all Cockatoos are not harmful. The black-plumaged portion have rather a good name. The eastern and western side of southern Australia each has its own species of Cockatoo, differing principally in the colour of the ear coverts. The western form is marked on that region with white, the eastern form with yellow. Both are useful birds from a forester's point of view.

Concerning the eastern one I append a few remarks. It is the Black Cockatoo (*Calyptrorhynchus funereus*, Shaw). This species is found in the moist mountainous parts of Australia. Three or more great birds screeching in their heavy flight along a humid valley impresses one.

The staple diet of the Funeral species is the larvæ of the Goat Moth or similar kinds, according to their abundance, and I venture to say partiality is shown for them as by the Roman epicure, the Australian bushman, or the aborigine. The present writer has also found them "tasty." I have seen great trees almost denuded of their bark by the attacks



Bare-eyed Cockatoos.

of these birds upon them in search of grubs. The absence of Woodpeckers (*Picidæ*), the natural enemy of wood-eating larvæ in Australia, is partly compensated for by this bird. As orchards open out in the eastern part of our colony this bird will play its rôle very nicely if left alone, for the time may come when longicorn and other beetle larvæ will bring trouble to the trees introduced for profit.

A writer in an old paper speaks of a great mass of timber levelled in order to oust a horde of hungry grubs, a course that probably may be followed under compulsion in the future if the numbers of this bird be reduced. They are, however, to be found so numerously distributed in the mountain districts that at times those parts seem blockaded by them.

Great scars in the trees assume the V-shape, some two inches deep, and young and old birds very quickly disfigure a part of a forest in search of the juicy grubs. The one-year-old bird is not nearly as expert as the warrior of maturer years, for, while he thinks and hesitates, the latter knows his business, and proceeds to dislodge the enemy upon a slender indication. The general appearance of the nest and eggs is not unlike that of those of *C. galerita*.

PART VI.

INSECTIVOROUS BIRDS AND OTHERS

Introduced from the Northern Hemisphere.

THE present part deals with birds not indigenous to our country, but now acclimatized. Among them are the Thrush, the Skylark, and Blackbird, so dearly loved of English poets.

The Sparrow represents the Finch family, a family as strong among birds as the daisy among plants, and having an equally wide influence in the order of nature. Of the usefulness of that bright little bird, the Goldfinch, after due investigation, I am thoroughly convinced. As for the Starling, it is still an open question if it will be found wanting when weighed in the balance of this Commonwealth's economy. It has certainly come to stay, and time alone will reveal the effects of its presence.

Colonel C. S. Ryan, M.B., writing in *The Emu*, January, 1906, says:—"It is interesting to notice how many of the European birds imported into this country and liberated have adapted themselves to new surroundings and thriven. In their native land they are kept more in check by many causes, such as death or migration, trapping, severe cold, &c. Here they are free from those difficulties, and have beside a much milder climate and abundance of food. Consequently, the natural increase is much more rapid, and they generally nest

twice, and sometimes thrice, in the season. It must be noticed, also, that the European birds now acclimatized here are of a strong and vigorous type, having ancestors accustomed to human habitations for centuries past. Our native birds, on the contrary, have only seen houses for a comparatively few years, hence they retire and keep to the bush as buildings increase. But not so most of the imported ones; these find a retreat among suburban gardens, and although heavy toll is paid by those that make open nests, in consequence of the raids of domestic cats, boys, &c., yet, by laying two or three clutches, they steadily increase. . . . Many other kinds than those most adapted to towns and cities have also been imported and liberated from time to time, but have not succeeded in establishing themselves. Perhaps this is just as well in some cases. It is probable that those that did not thrive were not so local in their habits, and therefore lost touch. One of the other causes may be that Australia is a big country, and a further one that they may not have been imported in sufficient numbers, or have been turned out in unsuitable localities. The birds that have succeeded are mostly omnivorous, and both the reputed seed-eaters and insect-eaters will frequently eat fruit when it is to be obtained, but during the rest of the year live on their natural food."

THE HOUSE SPARROW,

Passer domesticus, Macg.

THE European Sparrow, a member of the Finch family, is very widely distributed across our planet. Where grain will grow and where white men go it seems to follow. Essentially it is a bird of temperate regions, but as a colonizer the people of Australia and America know quite well its quality. Had the Hedge Sparrow of England been imported the blessing of birds with beaks purely insect-eating would have come with it. The misfortune is that each species in size and plumage is much alike. The important difference lies marked upon the beak formation—one being strongly made, for seed; the other slightly built, for soft-bodied insects. The want of knowledge of so small a difference has already cost us millions of pounds sterling.

In our midst we have both House and Tree Sparrows. The male of the House Sparrow has a crown uniform ashy-grey, with the sides of the neck a deep chestnut. In winter the plumage is duller, owing to the ashy-brown margins with which the feathers are supplied. These edges in a few days wear away, and without a moult give the full summer plumage. His modest mate differs in wanting the black throat, and in being browner. The young resemble the mother, which is whiter upon the lower surface of the body.

On the misdeeds of the House Sparrow one scarcely needs to dwell. As agriculturists for profit we find they continually take part in our monetary transactions. Still the bird is not altogether an unmixed blessing, according to the evidence* of Dr. Eleanor Ormerod before a Royal Commission in Great

* Consult "The Relation of the Sparrow to Agriculture," W. B. Barrows, U.S. Department of Agriculture.

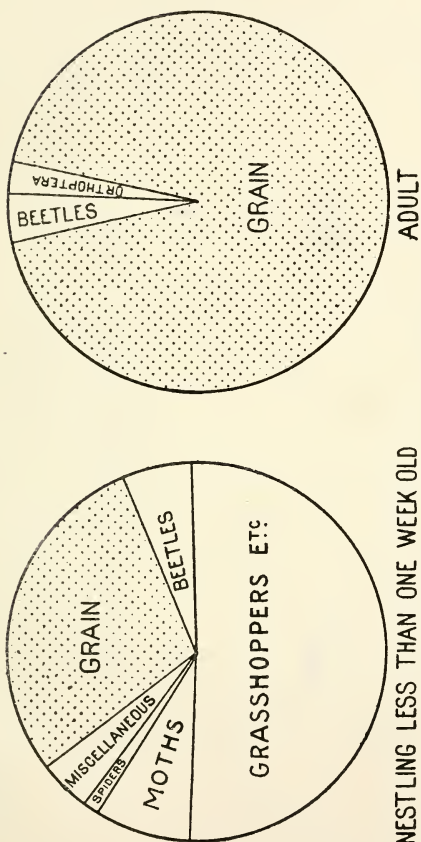


Diagram showing the Nature of Food of the **HOUSE SPARROW** when Immature and Aged.

This comparison is an early summer one, when grain food is predominant. During other seasons the adult consumes much less grain and many more insects. (Diagram from *Journal of Department of Agriculture, Washington, U.S.A.*)



Fig. A. Food of the young of an ordinary insect-eating bird during spring.

Fig. B. Food of the adult of the same bird during summer.

1. Spider. 2. Fruit-bug.
3. Chafer-beetle. 4. Grasshopper.
5. Destructive Caterpillar 6. Caterpillar of Cut-worm Moth.

The diagrams are from the "Year-Book of the Agricultural Department," Washington, U.S.A., and specially refer to the common Cuckoo.

Britain. For good or for ill its productive powers are proverbial, and as the rural industries develop in the Commonwealth, so will their avian follower, the Sparrow.

That the House Sparrow is of value in the towns and cities as a scavenger there is no doubt, while young Sparrows, as indicated in the chart, are unconsciously hungry for the good of their highest fellow, man.

THE TREE SPARROW,

Passer montanus, Macg.

THIS little bird is rarely seen in the town, preferring to avoid it and keep within the open country. Its distribution is also extensive. I met with it in the rice-fields of Japan. In many parts of Europe it is more abundant than the House Sparrow. It differs in plumage by having the head a uniform chocolate-brown and the sides of the neck white. Unlike the House Sparrow, there is scarcely any difference between the plumage of the Tree Sparrow in summer and winter. The summer plumage is not acquired by any shedding of the pale tips to the feathers. Except by being a little duller, the young resemble the parents. Their disposition is a cheerful one under nearly all circumstances. Amongst birds they are philosophers. In nest-building there is a stronger tendency to be thorough than is shown by the House Sparrow.

THE GOLDFINCH,

Carduelis carduelis, Sharpe.

THE crimson face and the golden patch on the wing make plain to us at once this sweet-voiced bird. It was introduced from Europe, over which it has a wide range. Now we have it strongly placed within our country. Although to be found in the environs of towns, it is essentially a bird of the country. I claim it as a useful bird. During the thistle season it feeds exclusively on its seeds, and is thus a help in the problem of weed destruction—"the war against weeds." This little bird is an agent for good in one direction—viz., that it is of much importance to the tiller of the soil. Certain garden weeds produce an incredible number of seeds. "A single plant of one of these species may mature as many as a hundred thousand seeds in a season, and if unchecked would produce in the spring of the third year ten billion plants." Fortunately, certain agents are at work to check this harvest, and perhaps the most efficient among them are the seed-eating birds. Since they attack weeds in the most critical stage of life—the seed period—it follows that their services must be of enormous practical value. The benefits are greatest in the case of "hoed" crops, since here are found the largest number of annual weeds, which depend very much upon seeds for perpetuation. Here is where the Goldfinch serves man well. In a new country, with roadsides and vacant fields everywhere, it is impossible for the most thrifty people to keep down weeds. It is just in these places where seed-eating birds strongly congregate. When the Goldfinch nests next year in one of our fruit trees, let us remember its trend for good, and encourage our boys to refrain from harassing the unconscious friend of man.

THE GREENFINCH,

***Chloris chloris*, Sharpe.**

THIS solid little bird is a green Finch in summer and a brown Finch in winter. In each season it always has the strong conical bill. In winter the brown tips of the feathers so carefully overlies each other that the main green feathers are not seen in the distance. When spring arrives the edges of the feathers all drop away, and thus we have a green bird for summer—the real Greenfinch—without the process of a moult. The geographical range is over Europe. Now it is in Australia for good or for ill, according as it will alter its ways with its new environment. So far it gives no trouble, although its food is partly seed. The species is quite a shy one, with a plain voice. In spring the monotone is at once recognized. It has been said that in Europe the voice of the bird has no counterpart in nature. A few years ago I remember being deceived by the call of this Finch, believing it to be the spring arrival of the cicada. Boys know the cicada as a green “locust,” that makes a special din when being quickly whirled round in the hand. The song is generally described as poor.

THE STARLING,

Sturnus vulgaris, Linn.

AMONGST birds, the Starlings rank as “Ambulatores” or “Walkers.” In this respect they are like the Magpies, and



The Starling.

unlike the Sparrows, which hop. When in the air the flight, direct or wheeling, is both graceful and rapid. They associate in flocks. Being black, with reflections of green and purple,

we find no other bird of like appearance in southern Australia. In Queensland the native Starling is black and scintillating, but in any other respect is a different bird. This species is a European bird that was introduced to our country many years ago. It has come to stay. Being gregarious, its every action for good or for ill is one of whole measure. It secures an incalculable amount of benefit for man in the destruction of injurious grubs and insects, but as it eats a considerable amount of fruit its good deeds as a grub-destroyer are apt to be left unconsidered. Up to the present time the bird as a helpmate to the grazier and farmer is a valuable one. To the orchardist the menace is a serious one. I certainly would recommend fruit-growers to use all precautionary measures. During September of this year I observed two couples in the country between the Murray and Wakool Rivers. For many years their descendants will be an unmixed blessing in that country. Mildura, to the west, beware! There is a little difficulty in distinguishing the seasonal changes in plumage. The adult in winter plumage is similar to the adult in summer plumage, with so many sandy-buff tips to the feathers as to make almost another bird of it. The young bird is entirely different from the adult, being almost uniform brown, with white abdomen, streaked with brown.

The nesting places are mostly in hollows of trees, out of which all the smaller birds must go immediately the Starling decides to build. This is most unfortunate, because our Kingfishers, Diamond-birds, and Tree-creeper are undoubted benefactors to man, and to be ranked among his best of neighbours.

THE SKYLARK.

Alauda arvensis, Linn.

ALTHOUGH the European Skylark is not a native of our Commonwealth it has "come to stay," and we extend to it the rich spirit of friendship. Boy of the destructive tendency, beware ! Still our country has its own Skylarks along the line of first cousinship. There are three species of them. The "Corn-bird," singing above the fields in the noon of night, sends forth a strain of music so rich that the sick in the midnight hour exclaim "Where?" and "What?" One has already said to the present scribe, "Why, that is the song of the bird that sings at heaven's gate!" Then we have the great Brown Song-Lark, and a go-between, the Rufous Song-Lark. All are fine vocalists, but none surpass this bird, the introduced species, the bird that inspired the poet to write :—

"Higher still and higher
From the earth thou springest,
Like a cloud of fire
The deep blue thou wingest,
And singing still dost soar, and soaring ever singest."

Is it any wonder the muse of such a bird leads on to Nature and a study of her ? The introduced bird is brownish, 7 inches in length, with a long hind toe, and confined to open fields. According to Mr. Le Souëf, of the Melbourne Zoological Gardens, a small lot was first let loose in 1863 ; 80 in 1867 ; 30 in 1870 and 1872, as well as some near Sydney ; and 100 in 1873-74. Of the last-mentioned the majority succumbed to a period of intensely cold weather immediately following their sea voyage. It is not yet well distributed over Australia, being slow to break new ground even when well planted in a

new locality. As opportunity occurs acclimatization should continue. No complaints have yet been lodged against them.

THE BLACKBIRD,

***Merula merula*, Seeb.**

THE love of fatherland is deeply planted within us. The Blackbird keeps pointing to it. In 1864 it was imported from Great Britain, and "Golden-bill" now ranks among the colonists. Generally speaking, it is to be found all over Europe. When in the best-wooded gardens of the suburbs we see a bird with a total length of 10 inches, plumage black, and with a bright yellow bill, we know at once it is the Merle. That is the male. The female is blackish and mottled beneath, with age becoming greyer. The young are rufous-brown with an amount of pale rufous mottling, especially upon the throat.

Except in spring it is a shy bird, seeking its food among the evergreen thickets and other foliage. To startle it means to get its chattering note as it flies away—beautiful, flute-like notes. The species is not gregarious.

The food of the Blackbird is insects and worms, with snails, and occasionally a soft fruit. Under certain circumstances it is forced to a fruit diet, and therein lies the trouble. Gardeners immediately take away its good name, and without any attempt to balance its finest qualities on the common scale of "advantage and disadvantage." For the greater part of the year it destroys large quantities of the injurious insects in our gardens. To the great mass of people the sight of the bird, and the pleasure of hearing its tuneful notes throughout the day should compensate for the small amount of harm committed in the gardens. It is their right to be welcome to a portion of the fruit.

THE SONG THRUSH,

Turdus iliacus*, Linn.

It is said that no true Thrushes occurred in Australia until this species arrived from Europe in 1872. The grey bird we know as the Harmonious Shrike-Thrush is our nearest vocal counterpart. Both are forms in whose company the people of each country may justly find much pleasure.

It is an olive-brown bird, with fore-neck, chest, and sides of body bright golden-buff, thickly marked with triangular or ovate spots of black, which become streaked upon the sides of the body, with the centre of breast and abdomen white.

The Botanic Gardens offer us inducement to spend an occasional hour with the promise of rest and the blending of birds' music. In Great Britain it is the opinion of most people that this bird is the finest songster of the empire, for, if it lacks the richness of tone of the nightingale, the song is far more sustained and varied. "The clever attempt of Macgillivray to put its song into words is familiar to most people, and though this is one of the best word imitations of a bird's song ever published, it does not give a full idea of that of the Thrush, for the simple reason that the bird never sings its song in the same order consecutively."†

The following is Mr. Witchell's‡ rendering of the music:—

* *Turdus iliacus*, Linn., is the bird that sings in the English parks and gardens, and the one already introduced into the Commonwealth. *Turdus musicus* is a winter migrant to Great Britain, and I believe is unknown in Australia. *T. musicus* has been the name in use for half a century, and custom may not yield its place to priority.

† R. B. Sharpe, LL.D., British Museum.

‡ "Evolution of Bird Song," C. A. Witchell.

Musica of the Thrush.

1. The Rose Tree
2. The Rose Tree
3. The Rose Tree
4. The Rose Tree
5. The Rose Tree
6. The Rose Tree
7. The Rose Tree
8. The Rose Tree
9. The Rose Tree
10. The Rose Tree
11. The Rose Tree
12. The Rose Tree
13. The Rose Tree
14. The Rose Tree
15. The Rose Tree
16. The Rose Tree
17. The Rose Tree
18. The Rose Tree
19. The Rose Tree
20. The Rose Tree

Large numbers distinguish the singers, double bars the strains.

Macgillivray's imitation of the song should be compared. It is as follows:—

“Dear, dear, dear
Is the rocky glen ;
Far away, far away, far away
The haunts of men.

Here shall we dwell in love
 With the lark and the dove,
 Cuckoo and corn-rail ;
 Feast on the banded snail,
 Worm, and gilded fly ;
 Drink of the crystal rill
 Winding adown the hill,
 Never to dry.

With glee, with glee, with glee,
 Cheer up, cheer up, cheer up ; here
 Nothing to harm us ; then sing merrily,
 Sing to the loved ones whose nest is near,

Qui, qui, qui, kweeu, quip,
 Tiurru, tiurru, chipiwi,
 Too-tee, too-tec, chiu choo,
 Chirri, chirri, choo-ee,
 Quiu, qui, qui.

To those of us familiar with the song, the above setting, when carefully whistled, must bring back to memory the joy of last spring and its Thrushes. This is how it appeals to the present writer.

Both male and female sit in turn upon the eggs to incubate them, and when the young are ready to fly they accompany their parents in search of worms. It is a pretty sight to see an old Thrush teaching one of its progeny to pick up a worm all for itself.

In the Thrush the garden shell-snail finds an active enemy. It is of much importance to those who love their garden to encourage as many of this species to stay about the place as possible. Young people should be induced to be kindly disposed towards the Thrush, because it is a tame and confiding bird, with an interest in life that lends a charm to ours. Busy people need rest : go, therefore, at times into partnership with the bird and the field of the twilight, and get it. Draw from the gloaming its secret of joy.

INDIAN MYNA,

***Acridotheres tristis*, Bonn. et Vieill.**

HERE we have an "import" from India or Afghanistan. It ranges through those countries in south-east Asia. The Myna or Minah was first introduced to Australia in 1863, 42 being set free in Victoria; in 1864 another batch of 40 birds was let loose; in 1866 a small number; while in 1872 there were 70 liberated. No more are needed. If we introduced it into Australia because of its voice we could have done better by securing the larger Indian variety with a linguistic tendency that I know no other bird to have in such full measure. I am just inclined to believe we again secured the wrong species, sacred though it be to the god-ram Deo. Still it is fond of the society of man, makes cheerful the environment of the cities, and, except for a slight damage to fruit, is generally to be commended.

In appearance it is a ruddy brown, with a white spot on each wing as a recognition mark. By this means other birds know it at once when flying. It builds a large, coarse nest in water-spouts of dwellings, and lays blue eggs. After nesting time they become gregarious, within reasonable bounds. The cheerfulness of the young adds considerably to the joy of living, the people of the suburbs of cities getting the benefit.

TURTLE-DOVE,

***Turtur suratensis*, Strickel.**

MR. D. Le Souëf, Director of the Melbourne Zoological Gardens, tells me that the first imported doves of this species were liberated in 1870; and 16 more in 1874, which gradually increased. "They are now spreading around Port Phillip on

its eastern side, where the tea-tree scrub offers them capital cover. They will probably continue to spread in scrubby country, but slowly. . . . Now and again small lots have been sent to country towns, but, as a rule, they have not succeeded, being destroyed by birds of prey."

I have observed odd birds about Western Port. In 1872 eight Turtle-Doves (*Turtur communis*) were imported. No trace is now to be found of them.

WITH the whole number of attempted introductions of foreign birds into Australia I am scarcely acquainted. Colonel C. S. Ryan, P.M.O., provides a list in *The Emu*, vol. v., 1906. In it references are made to the following birds not already mentioned in this work :—

JAVA SPARROWS (*Padda oryzivora*).—A stronger-billed bird than the common Sparrow. Since 1863 some 535 have been liberated, and still they failed to keep their footing in the new land. It is just as well.

CHINESE SPARROWS.—In 1863, 45 were liberated, and all have vanished.

CHAFFINCHES (*Fringilla caelebs*).—In 1863, 50 were liberated; in 1864, 40; and 40 more in 1872. They have not thriven, and few, if any, are now living.

YELLOW-HAMMERS (*Emberiza citrinella*).—Two consignments of 15 each were liberated in 1863-64. They were hardly in sufficient numbers to obtain a footing, and have disappeared.

SISKIN FINCHES (*Chrysomitris spinus*) were imported in 1864, when 40 were set free. In 1872, 20 were liberated. Evidently they got scattered, lost touch with each other, and have become exterminated in this country.

ENGLISH ROBINS (*Erithacus rubecula*) were let loose in two small parcels of 7 and 4. Being few, they soon disappeared.

ORTOLANS (*Emberiza hortulana*) were liberated near Melbourne in 1863. Being only 16 in number, they soon disappeared. Eighteen CANARIES, let loose in 1872, also disappeared.

PIN-TAILED SAND-GROUSE (*Pterocles exustus*) were liberated in 1863—20 of them. Two smaller lots were turned out on Phillip Island. The quantities may have been too small, or the localities unsuited to them, as they failed to increase, and finally disappeared.

INDIAN JUNGLE FOWL, GUINEA FOWL, AND PEAFOWL were all tried about the time the Grouse above were introduced. There were 170 Guinea Fowls, but in all cases acclimatization failed. Their enemies were too many and strong.

CHUKAR PARTRIDGES (*Caccabis chukar*) were imported in 1865—23 of them. This and two later small consignments made no headway. I believe they left no offspring. The same unfortunate result occurred with a number of French Partridges in 1873.

CHINESE QUAIL (*Excalfactoria chinensis*) were liberated in Victoria in 1864—80 of them near Melbourne, and 70 on Phillip Island. It is so difficult to distinguish them from our indigenous species of King Quail that it is difficult to say what exactly has occurred.

PHEASANTS (*Phasianus colchicus*) have been imported since 1864 on several occasions. Because of poisoned grain placed for rabbits this species very slowly makes its increase. This is the "stumbling block" to their acclimatization.

MALLARD OR ENGLISH WILD DUCK (*Anas boschas*) were liberated in southern Victoria in 1871-72—40 in one lot, 80 in a second. They reproduced themselves in the Botanical Gardens, but eventually flew away and became lost.

With the whole number of species of foreign birds introduced into the southern half of the Commonwealth I may not be acquainted. Odd birds come from time to time, and little further is heard of them. Systematic efforts on a large scale are necessary, but not always to be countenanced or commended. The patriotism of the men who would introduce the “hundred-throated” Nightingale of England (*Daulias luscinia*), and the Mocking-bird of North America (*Mimus polyglottus*) would surely bring its just reward. As song birds they are among the marvels of the bird world. Whatever tends to brighten the lives of men is worth the greatest consideration.

GLOSSARY.

- AXILLA.—Arm-pit, junction of wing and body.
AXILLARIES.—Feathers growing from the arm pit.
CERE.—Membrane at base of upper mandible.
COVERTS.—Feathers covering the bases of wing and tail quills.
CULMEN.—Highest middle lengthwise line of upper mandible.
DERTRUM.—Swollen tip of bill.
EMARGINATED.—Notched.
GAPE.—Line of commissure of mandible.
GENYS.—Under middle line of lower mandible from junction of prongs to tip.
HALLUX.—Hind toe.
HEXAGONAL.—Six-sided and six-angled.
HOOKLETS.—Innumerable small hooks in the barb of a feather.
INTERSCAPULUM.—Between shoulders.
LANCEOLATE.—Tapering.
LORE.—Space between eye and base of upper mandible.
MANDIBLES.—Upper and lower jaws with their covering.
MAXILLA.—Lateral margin of upper mandible.
NUCHAL.—Pertaining to region of neck.
OCCIPUT.—Hind head.
OPERCULUM.—A lid.
ORBITAL.—Region of eye.
PECTINATED.—Resembling the teeth of a comb.
PECTORAL.—Breast region.
PRIMARIES.—Main flight feathers growing on pinion or hand.
RECTRICES.—Tail quills.
RICTAL.—Pertaining to gape.
SCUTELLATE.—Having small plate-like surfaces.
SECONDARIES.—Flight feathers seated on the fore-arm (ulna).
SHAFT.—Main stem of feather.
SPATULATE.—Spoon-shaped.
SPECULUM.—Conspicuous bright spot.
SYNDACTYL.—Toes joined in part of length.
TARSUS.—Lower part of leg.
VERMICULATE.—To inlay; worm-like tracks.
ZYGODACTYL.—Toes arranged in pairs, two in front and two behind.
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